

# VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the **reissuance** of the VPDES permit listed below. This permit is being processed as a **Minor, Municipal** permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et.seq. The discharge results from the operation of a wastewater treatment facility consisting of the following units: main pump station; mechanical screen; hydraulic vortex grit removal system; splitter box; two sequenching batch reactors (SBRs), which provide aeration, clarification, and removal of nutrients and suspended solids; post equalization basin; tertiary filters; ultraviolet light disinfection system; parshall flume with ultrasonic level sensor; post aeration facilities; effluent line; two aerobic digesters; sludge press. This permit action consists of limiting pH, CBOD<sub>5</sub>, suspended solids, E.coli, ammonia nitrogen and dissolved oxygen; and including special conditions regarding sewage sludge use and disposal, compliance reporting, control of significant dischargers, water quality criteria monitoring and other requirements and special conditions.

SIC Code: 4952

1. Facility Name and Location:  
Northern Tazewell County Wastewater Treatment Facility  
2748 Rosenbaum Road  
Bluefield, VA 24605
2. Permit No. VA0091588  
Expiration Date: December 21, 2009
3. Owner Name and Address: Tazewell County Public Service Authority  
P.O. Box 190  
North Tazewell, VA 24630  
Owner Contact: James H. Spencer  
Title: Administrator  
Telephone No: (276) 988-2243
4. Application Complete Date: 7/20/2009  
Permit Drafted By: Fred M. Wyatt, SWRO Date: 06/22/2009  
Reviewed By: Steve E. Arty Date: 7/19/2009  
Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_  
Public Comment Period Dates: from 10/02/2009 to 11/02/2009
5. Receiving Stream Name: Laurel Fork; River Mile: 9-LRR003.15; Basin:  
New River; Subbasin: None; Section: 1g; Class: IV; Special Standards:  
None  
  
7-Day, 10-Year Low Flow (7Q10): 0.095 MGD (June - Dec.)  
1-Day, 10-Year Low Flow (1Q10): 0.067 MGD (June - Dec.)  
7Q10 High Flow: 0.175 MGD (Jan. - May)  
1Q10 High Flow: 0.081 MGD (Jan. - May)  
30-Day, 10-Year Low Flow (30Q10): 0.15 MGD  
  
Tidal? NO  
  
303(D) list? Yes
6. Operator License Requirements: Class III

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7. Reliability Class: III
8. Permit Characterization:  
( ) Private ( ) Federal ( ) State (X) POTW ( ) PVOTW  
( ) Possible Interstate Effect ( ) Interim Limits in Other Document
9. Attach a schematic of wastewater treatment system, and provide a general description of the activities of the facility.

## Discharge Description

OUTFALL NUMBER	DISCHARGE SOURCE (1)	TREATMENT (2)	FLOW (3)
001	Town of Pocahontas, Pocahontas Prison, Abbs Valley	See Page 1 above, first paragraph	0.500 MGD

- (1) List operations contributing to flow (2) List treatment units  
(3) Design flow

10. Sewage Sludge Use or Disposal: The digested sludge is shipped to the Tazewell County Landfill for final disposal.
11. Discharge Location Description: See attached Quadrangle; Number: 115D, Bramwell WVA, VA
12. Material Storage: None reported
13. Ambient Water Quality Information: Mainstream Laurel Fork, a tributary of Bluestone River, is listed as impaired from the Curran Branch confluence, river mile 5.90, to the West Virginia line at river mile 1.35. At DEQ station 9-LRR001.99, 5 of 11 (45%) fecal samples and 5 of 11 (45%) e.coli samples exceeded water quality standards. For the same dataset, 4 of 5 (80%) geomeans violated the water quality standard for e.coli. At the AWQM monitoring station located at 9-LRR001.39, dissolved oxygen violations were less than 10% and e.coli bacteria violations were found in 59% (10 of 17) of samples collected. A DEQ special study confirmed impairments. Total Phosphorus screening value was exceeded twice in 18 samples collected. Lead was detected in a white sucker (0.16 ppm) collected on 9/14/2000.
14. Antidegradation Review & Comments: Tier I (X) Tier II Tier III

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards.

Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water

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bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters. The antidegradation review begins with a Tier determination. The receiving stream is Tier I, since the impaired (for dissolved oxygen, bacteria, and benthics) segment, listed on the 303 (D) report, is immediately downstream of the proposed discharge point.

15. Site Inspection: A technical assistance/start-up inspection was conducted on September 26, 2007 by Wade B. Carico, Water Compliance Specialist, Sr.

16. Effluent Screening & Limitations Development:  
In the previous permit, PART I D.11. Special Condition - Water Quality Monitoring and ATTACHMENT A required the permittee to conduct water quality criteria monitoring for the substances in the Virginia Water Quality Standards (WQS). This data was to be submitted with the reissuance application at least 180 days prior to the permit expiration date. Since this data was not submitted with the reissuance application, this requirement is being re-instated in the reissuance permit.

On January 15, 2003, new bacteria standards in 9 VAC 25-260-170.A became effective, as did the revised disinfection policy of 9 VAC 25-260-170.B. These standards replaced the existing fecal coliform standard and disinfection policy of 9 VAC 25-160-170. E.coli (fresh water) and enterococci (saltwater and transition zone) criteria replaced the existing fecal coliform criteria. Since this facility disinfects with ultraviolet radiation, the permit contains effluent limits for E.coli.

Basis for Effluent Limitations:

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS				MONITORING REQUIREMENTS	
		MONTHLY AVERAGE	WEEKLY AVERAGE	MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow	NA	NL	NA	NA	NL	Continuous	Totalizing & Recording
PH	2	NA	NA	6.0 SU	9.0 SU	1/Day	Grab
CBOD <sub>5</sub> (June-Dec.)	2,5	18 mg/l 34 k/d	27 mg/l 51 kg/d	NA	NA	3 Days/Week	8 Hour Composite
CBOD <sub>5</sub> (Jan.- May)	2,5	22 mg/l 42 k/d	33 mg/l 63 kg/d	NA	NA	3 Days/Week	8 Hour Composite
Total Suspended Solids	1	30 mg/l 57 kg/d	45 mg/l 85 kg/d	NA	NA	3 Days/Week	8 Hour Composite
E.coli**	2	126 n/100 ml	NA	NA	NA	1/Week***	Grab
Ammonia Nitrogen (June-Dec.)	2,5	8.9 mg/l	8.9 mg/l	NA	NA	3 Days/Week	8 Hour Composite
Ammonia Nitrogen (Jan.-May)	2,5	12 mg/l	12 mg/l	NA	NA	3 Days/Week	8 Hour Composite
Dissolved Oxygen	2,5	NA	NA	6.5	NA	1/Day	Grab

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- \*1. Federal Effluent guidelines
- 2. Water Quality-based Limits:
- 3. Best Engineering Judgement
- 4. Best Professional Judgement
- 5. Other (e.g. wasteload allocation model)

\*\* Geometric Mean

\*\*\* Between 10:00 a.m. and 4:00 p.m.

- 17. Basis for Sludge Use & Disposal Requirements : The VPDES Permit Regulation (9 VAC 25-31-10 et seq.), adopted by the State Water Control Board May 22, 1996, became effective on July 24, 1996. Among other program changes, the newly adopted regulation incorporated technical standards for the use or disposal of sewage sludge.
- 18. Antibacksliding Statement: NA
- 19. Compliance Schedule: NA
- 20. Special Conditions:

**PART I.B. Special Condition - Compliance Reporting Under Part I.A.**

**Rationale:** Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when toxic pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

**PART I.C. Control of Significant Dischargers**

**Rationale:** VPDES Permit Regulation, 9 VAC 25-31-730 through 900, and 40 CFR part 403 require certain existing and new sources of pollution to meet specified regulations.

**PART I.D. Other Requirements and Special Conditions**

**1. Treatment Plant Flows**

**Rationale:** Required by VPDES Permit Regulation, 9 VAC 25-31-200 B.2. for all POTW and PVOTW permits.

**2. Indirect Dischargers**

**Rationale:** Required by VPDES Permit Regulation, 9 VAC 25-31-200 B.1. for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

**3. CTC, CTO Requirement**

**Rationale:** Required by the Code of Virginia § 62.1-44.19: Sewage Collection and Treatment Regulations, 9 VAC 25-790.

**4. O&M Manual Requirement**

**Rationale:** Required by VPDES Permit Regulation, 9 VAC 25-31-190 E.

**5. Licensed Operator Requirement**

**Rationale:** The VPDES Permit Regulation, 9 VAC 25-31-200 D. and The Code of Virginia § 54.1-2300 et seq, Rules and Regulations for Waterworks and

Wastewater Works Operators (18 VAC 160-20-10 et seq.), requires licensure of operators.

**6. Reliability Class**

**Rationale:** Required by Sewerage Regulations, 9 VAC 25-60-20 and 40 for all municipal facilities.

**7. Treatment Works Closure Plan**

**Rationale:** State Water Control Law § 62.1-44.19. This condition is used to notify the owner of the need for a closure plan where a treatment works is being replaced or is expected to close.

**8. Total Maximum Daily Load (TMDL) Reopener**

**Rationale:** Section 303(d) of the Clean Water Act requires the total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it in compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in the permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under Section 303 of the Act.

**9. Water Quality Criteria Monitoring**

**Rationale:** State Water Control Law §62.1-44.21 authorizes the Board to request information/needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, Subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility's effluent for the substances noted in Attachment A of this VPDES permit.

**10. Sludge Reopener**

**Rationale:** Required by VPDES Permit Regulation, 9 VAC 25-31-220C.4. for all permits issued to treatment works treating domestic sewage.

**11. Sludge Use and Disposal**

**Rationale:** VPDES Permit Regulation, 9 VAC 25-31-100 P.; 220 B.2.; and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal. Technical requirements may be derived from the Department of Health's Biosolids Use Regulations, 12 VAC 5-585-10 et seq.

**PART II, Conditions Applicable to All Permits**

**Rationale:** VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

21. Changes from the previous permit contained in the reissuance permit: The special condition in the previous permit in PART D.12. regarding connection of the Pocahontas STP to the Northern Tazewell County Regional WWTP has been eliminated.

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Reduced Monitoring: The WWTP facility does not qualify for reduced monitoring under EPA's Interim Guidance for Performance Based Reductions of NPDES Permit Monitoring Frequencies, since it is a new facility which has only been in operation approximately one year.

- 22. Variances/Alternate Limits or Conditions: None
- 23. Regulation of Users: 9 VAC 25-31-280 B 9 - NA
- 24. Public Notice Information required by 9 VAC 25-31-280 B:

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all the persons represented by the commenter/requester. A request for a public hearing must also include; 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit and suggested revisions. DEQ may hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION:

Name: Fred M. Wyatt

Address: DEQ, Southwest Regional Office, P.O. Box 1688, 355 Deadmore Street, Abingdon, Virginia, 24212- 1688 Phone: (276) 676-4810 E-mail: fmwyatt@deq.virginia.gov Fax: (276) 676-4899

Following the comment period, the Board will make a determination regarding the proposed **reissuance**. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

25. Additional Comments:

**Application Waivers:** The staff is granting testing waivers for the following parameters in Part B.6 of Application Form 2A: TKN, nitrate plus nitrite nitrogen, oil and grease, phosphorus, and total dissolved solids.

**Permit Fee:** A reissuance application fee is not required. However, an annual maintenance fee of \$1,500 is required by October 1 of each year.

**Threatened and Endangered (T&E) Species:** According to the attached printout from the Department of Game and Inland Fisheries (DGIF), Virginia Fish and Wildlife Information Service, no threatened or endangered species have been identified within a two mile radius of the

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discharge. This facility is not on the T&E coordination review lists from either the Department of Conservation and Recreation (DCR) or DGIF.

*Previous Board Action:* None

*Permit History:* VPDES Permit No. VA0091588 was issued on December 22, 2004 and has an expiration date of December 21, 2009.

Staff Comments:

Public Comments:

26. 303(d) listed segments (TMDL): This facility discharges directly to Laurel Fork. The mainstream stream segment receiving the effluent is listed for non-attainment of dissolved oxygen, E.coli, and sediment in Part I of the current approved 303(d) list. Laurel Fork is listed as impaired from the Curran Branch confluence, river mile 5.90, downstream to the Virginia-West Virginia line at river mile 1.35 for a total of 4.55 miles. The TMDL for dissolved oxygen, E.coli, and sediment was approved by EPA on 03/27/2007 and by the State Water Control Board on 04/11/2008. The TMDL contains an E.coli WLA for this discharge of  $2.61 \times 10^{12}$  cfu/year and a sediment WLA of 20.73 Mg/year. This permit has an E.coli limit of 126 n(cfu)/100 ml (geometric mean) that is in compliance with the TMDL. This permit has total suspended limits of 57 kg/day (monthly average) and 85 kg/day (weekly average), which are in compliance with the TMDL.

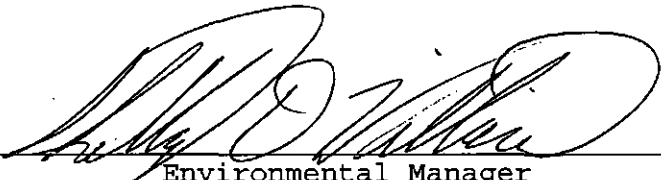
PLANNING CONCURRENCE FOR MUNICIPAL VPDES PERMIT

PERMIT NO. VA0091588

FACILITY: Northern Tazewell County WWTF

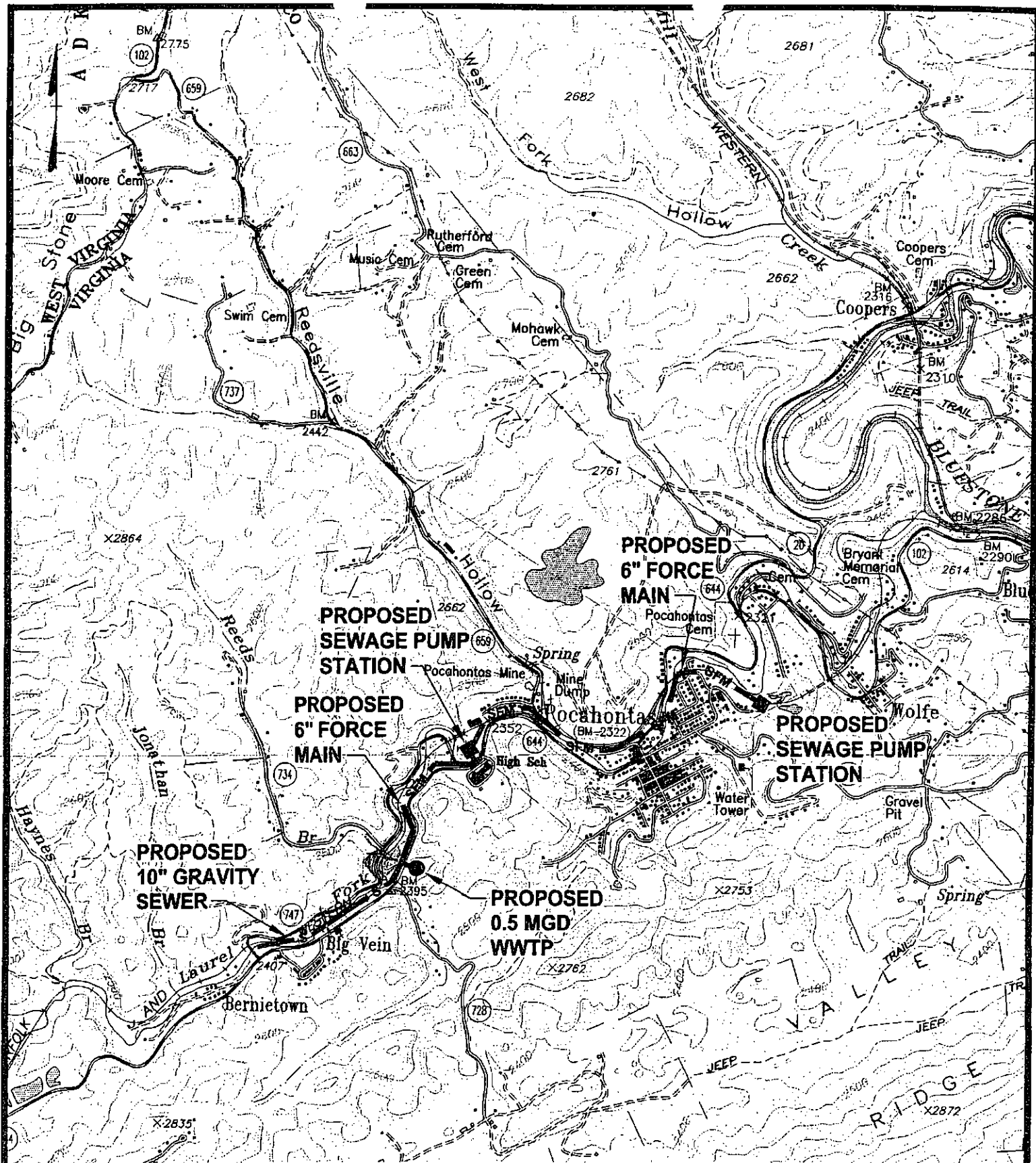
COUNTY: Tazewell

- [ ☒ ] 1. The discharge is in conformance with the existing planning documents for the area.
- [ ☐ ] 2. The discharge is not addressed in any planning document but will be included, if required, when the plan is updated.
- [ ☐ ] 3. Other.

  
\_\_\_\_\_  
Environmental Manager

11/04/2009  
\_\_\_\_\_  
Date





# PROPOSED FACILITIES LOCATION MAP

SOURCE: BRAMWELL WEST VA. - VA.  
U.S.G.S. QUADRANGLE

DESIGNED BY	SCALE 1" = 2000'
DRAWN BY	DATE SEPTEMBER 2004
PROJECT NO. 7848-13	

NORTHERN TAZEVELL WASTEWATER TREATMENT FACILITY  
FOR THE  
TAZEVELL COUNTY BOARD OF SUPERVISORS



SHEET
EXHIBIT 1

# Summary Report for Laurel Fork

ID: VAS-N37R\_LRR01A94

State: VA - 2008

Single Cat.(User Cat.): 4A(4A)

<b>Water Information:</b>	<b>Laurel Fork</b>	
	<b>Location:</b> Laurel Fork mainstem from the Curran Branch confluence, river mile 5.90, to WV line at river mile 1.35 on the Anawalt and Brammwell quad sheets. Section 1, Class IV.	<b>Water Type:</b> RIVER <b>Size:</b> 4.54 MILES
	<b>Next Scheduled Monitoring Date:</b> N/A	

## Use Information

<b>Assessed:</b>	<b>Attainment Status</b>	<b>Uses (Class: IV)</b>
	Fully Supporting	Fish Consumption Wildlife
	Not Supporting	Recreation (VAS-N37R-01) Aquatic Life (VAS-N37R-01)
<b>Not Assessed:</b>	Not Assessed	Public Water Supply

## Types of Assessment

<b>Assessment Type</b>	<b>Uses</b>	<b>Assessment Confidence</b>
PHYSICAL/CHEMICAL	Aquatic Life Fish Consumption Wildlife	
PATHOGEN INDICATORS	Recreation	

<b>Assessment Method</b>	<b>Uses</b>
Bacteria - E. Coli	Recreation
Fixed station physical/chemical (conventional plus toxic pollutants)	Wildlife
SPMD water column toxics	Fish Consumption

## Additional Location Information

COUNTY	TAZEWELL CO
HUC	05050002

## Cause Information

<b>Causes</b>	<b>Associated Uses</b>	<b>Pollutant?</b>	<b>Confidence</b>
Benthic-Macroinvertebrate Bioassessments (N37R-01-BEN)	Aquatic Life	Yes	H

Escherichia coli (N37R-01-BAC)	Recreation	Yes	H
Oxygen, Dissolved (N37R-01-DO)	Aquatic Life	Yes	H

**Listing Information**

Causes	Cycle First Listed	TMDL Schedule	TMDL Completed?
Benthic-Macroinvertebrate Bioassessments	1996	2006	<u>Yes</u>
Escherichia coli	2006	2006	<u>Yes</u>
Oxygen, Dissolved	1994	2006	<u>Yes</u>

**Source Information**

Sources	Associated Causes	Confirmed?
Sanitary Sewer Overflows (Collection System Failures)	Escherichia coli Oxygen, Dissolved	N
Septage Disposal	Escherichia coli Oxygen, Dissolved	N
Source Unknown	Benthic-Macroinvertebrate Bioassessments	N

**Comments On:****Overall Assessment**

Section 1, Class IV. SPMD deployment in Fall 2005; PCB-640 pg/l. At DEQ station 9-LRR001.99, 5 of 11 (45%) fecal samples and 5 of 11 (45%) e.coli samples exceeded the water quality standards. For the same data set 4 of 5 (80%) geomeans violated the water quality standard for e.coli. As exceeded the criteria in two species of fish. At the AWQM monitoring station located at 9-LRR001.39 dissolved oxygen violations were less than 10% and e.coli bacteria violations were found in 59% (10 of 17) of samples collected. A DEQ Special Study confirmed impairments. TP screening value was exceeded twice in 18 samples collected. Lead was detected in a white sucker (0.16 ppm) collected on 9/14/2000.

**Causes**

<b>Benthic-Macroinvertebrate Bioassessments</b>	Category 4A 2006 00259 / 2008 N37R-01-BEN TMDL 32210 EPA approved 03.27.2007
<b>Escherichia coli</b>	Category 4A 2006 00260 / 2008 N37R-01-BAC TMDL 32211 EPA approved 03.27.2007
<b>Oxygen, Dissolved</b>	Category 4A 2006 00261 / 2008 N37R-01-DO TMDL 32210 EPA approved 03.20.2007



## Search for Approved TMDL Reports

To return all records, simply click the Search button without entering any criteria.

Watershed ID			example searches: B17R, b, 17, r
Waterbody Name	Laurel Fork		example searches: Opequon Creek, OPEQUON, op
City/County			example searches: Albemarle, ALB, albem
Major River Basin	New River Basin		
Pollutant	Dissolved Oxygen		
EPA Approval Date (Year)			
SWCB Approval Date (Year)			
<div>Search Clear form</div>			

## Approved TMDL reports

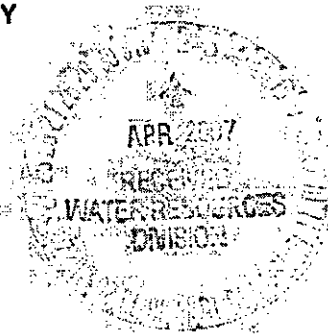
Displaying 1 result.

TMDL Project	Basin	City/County	Watershed ID	Pollutant(s)	Comment document	Final report	EPA approval date	SWCB approval date
<u>Laurel Fork Watershed</u>	New River	Tazewell, Pocahontas	N37R	Dissolved Oxygen E. Coli Sediment	-	Final report	03/27/2007 <u>EPA rationale</u>	04/11/2008

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029



Dr. Ellen Gilinsky, Director  
Division of Water Quality Programs  
Virginia Department of Environmental Quality  
629 Main Street  
Richmond, VA 23219

MAR 27 2007

Dear Dr. Gilinsky:

The U.S. Environmental Protection Agency (EPA) Region III is pleased to approve the Total Maximum Daily Loads (TMDLs) for the aquatic life and primary contact use impairments on Laurel Fork. The TMDLs were submitted to EPA for review on October 6, 2006. The TMDLs were established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address impairments of water quality as identified in Virginia's 1998 Section 303(d) list.

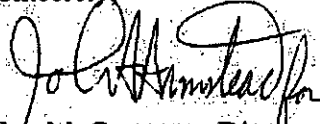
In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) be designed to attain and maintain the applicable water quality standards, (2) include a total allowable loading and as appropriate, wasteload allocations (WLAs) for point sources and load allocations for nonpoint sources, (3) consider the impacts of background pollutant contributions, (4) take critical stream conditions into account (the conditions when water quality is most likely to be violated), (5) consider seasonal variations, (6) include a margin of safety (which accounts for uncertainties in the relationship between pollutant loads and instream water quality), (7) consider reasonable assurance that the TMDL can be met, and (8) be subject to public participation. The enclosure to this letter describes how the TMDLs for the aquatic life and primary contact use impairments satisfy each of these requirements.

As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL WLA pursuant to 40 CFR §122.44 (d)(1)(vii)(B). Please submit all such permits to EPA for review as per EPA's letter dated October 1, 1998.



If you have any questions or comments concerning this letter, please don't hesitate to contact Mr. Thomas Henry, Program Manager, at (215) 814-5752.

Sincerely,



Jon M. Capacasa, Director  
Water Protection Division

Enclosure



## EXECUTIVE SUMMARY

### ***Background and Applicable Standards***

Laurel Fork was first listed as impaired in 1994. A 2.84-mile segment of Laurel Fork was listed again on the *1996 303(d) TMDL Priority List* for violations of the fecal coliform bacteria standard and the General Standard (benthic) (VADEQ and VADCR, 1996). The *1998 303(d) Total Maximum Daily Load Priority List and Report* lists Laurel Fork for dissolved oxygen (DO) standard violations as well as for violations of the fecal coliform bacteria standard and the General Standard (benthic, sediment) (VADEQ, 1998). Laurel Fork continued to be listed on the *2002 303(d) Report on Impaired Waters* and on the *2004 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report* (VADEQ, 2004). In 2004, an additional 0.07-mile segment of Laurel Fork was included in the report. The impaired stream segment was updated again for the 2006 assessment. Data collected from station 9-LRR005.59 during a Total Maximum Daily Load (TMDL) special monitoring study showed violations of the bacteria standard and so the TMDL impairment reach was extended upstream to Curran Branch at river mile 5.90. The impaired segment extends from river mile 5.90 downstream to the Virginia-West Virginia state line at river mile 1.35 for a total of 4.55 miles.

### ***TMDL Endpoint and Water Quality Assessment***

#### **Fecal Coliform**

Potential sources of fecal coliform include both point source and nonpoint source (NPS) contributions. Nonpoint sources include: wildlife, grazing livestock, land application of manure, land application of biosolids, urban/suburban runoff, failed and malfunctioning septic systems, and uncontrolled discharges (straight pipes). Three permitted point sources are associated with the Laurel Fork watershed through the Virginia Pollutant Discharge Elimination System (VPDES). All of these facilities are permitted for fecal control, with design discharges ranging from <0.001-0.50 MGD.

Fecal bacteria TMDLs in the Commonwealth of Virginia are developed using the *E. coli* standard. For this TMDL development, the in-stream *E. coli* target was a geometric

mean not exceeding 126-cfu/100 mL and a single sample maximum of 235-cfu/100 mL. A translator developed by VADEQ was used to convert fecal coliform values to *E. coli* values.

### **General Standard (benthic) - Sediment**

A TMDL must be developed for a specific pollutant(s). Benthic assessments are very good at determining if a particular stream segment is impaired or not, but generally do not provide enough information to determine the cause(s) of the impairment. The process outlined in the Stressor Identification Guidance Document (EPA, 2000) was used to identify stressors affecting Laurel Fork. Chemical and physical monitoring data from VADEQ monitoring stations provided evidence to support or eliminate potential stressors. The potential stressors are: sediment, toxics, low dissolved oxygen, nutrients, pH, metals, conductivity/total dissolved solids, temperature, and organic matter.

The results of the stressor analysis for Laurel Fork are divided into three categories:

**Non-Stressor(s):** Those stressors with data indicating normal conditions, without water quality standard violations, or without the observable impacts usually associated with a specific stressor, were eliminated as possible stressors.

**Possible Stressor(s):** Those stressors with data indicating possible links, but inconclusive data, were considered to be possible stressors.

**Most Probable Stressor(s):** The stressor(s) with the most consistent information linking it with the poorer benthic and habitat metrics was considered to be the most probable stressor(s).

The results indicate that sediment is the Most Probable Stressor for Laurel Fork and were used to develop the benthic TMDL.

Sediment is delivered to Laurel Fork through surface runoff, streambank erosion, and natural erosive processes. During runoff events, sediment is transported to streams from land areas. Rainfall energy, soil cover, soil characteristics, topography, and land management affect the magnitude of sediment loading. Land disturbances from mining, forest harvesting, and construction accelerate erosion at varying degrees. Sediment transport is a natural and continual process that is often accelerated by human activity. An increase in impervious land without appropriate stormwater control increases runoff



volume and peaks, which leads to greater potential for channel erosion. During dry periods, sediment from air or traffic builds up on impervious areas and is transported to streams during runoff events. Fine sediments are included in total suspended solids (TSS) loads that are permitted for wastewater, industrial stormwater, and construction stormwater discharge.

### **Dissolved Oxygen**

Potential sources affecting in-stream dissolved oxygen concentrations include both point source and nonpoint source (NPS) contributions. Potential point sources include wastewater treatment plants, industrial facilities, combined sewer overflows, sanitary sewer overflows, and stormwater runoff. Potential nonpoint sources include erosion of sediments, grazing livestock, land application of fertilizers and manure, land application of biosolids, urban/suburban runoff, failed and malfunctioning septic systems, and uncontrolled discharges (straight pipes).

The source of the low dissolved oxygen in Laurel Fork is thought to be non-regulated sewage discharges and exfiltration and overflows from the Pocahontas Sewage Treatment Plant, as well as uncontrolled discharges and sediment. The sources will be addressed by the development of the fecal bacteria TMDL and the benthic TMDL for sediment.

### **Modeling Procedure**

#### **Hydrology**

The US Geological Survey (USGS) Hydrologic Simulation Program - Fortran (HSPF) water quality model was selected as the modeling framework to model hydrology and fecal coliform loads.

For purposes of modeling watershed inputs to streamflow and in-stream fecal bacteria, the Laurel Fork drainage area was divided into five subwatersheds. A paired watershed approach was utilized to calibrate the hydrology of Laurel Fork. Sand Run in Upshur County, West Virginia (USGS Station #03052500) was selected as the paired watershed based on comparative hydrologic characteristics. The representative time period used for hydrologic calibration of Laurel Fork covered the period 10/1/1992 through 9/30/1997.

Hydrology validation was not performed for Laurel Fork because there were only six measurements of flow collected during the representative modeling period. All observed data collected during this time period was used for hydrology calibration. It was determined that using all available data for calibration would result in a more accurate model.

### **Fecal Coliform**

The fecal coliform calibration for Laurel Fork was conducted using monitored data collected at VADEQ monitoring station 9-LLR001.39. The five years with the most fecal coliform data (23 samples) were used as the calibration time period, 10/1/1994 through 9/30/1999. The fecal coliform validation for Laurel Fork was conducted using monitored data collected at VADEQ monitoring station 9-LLR001.39. For fecal coliform validation, the period selected was 10/1/1990 through 9/30/1994, during which 13 samples were collected. Modeled fecal coliform levels matched observed levels indicating that the model was well calibrated.

The allocation precipitation time period was selected to coincide with the hydrologic calibration time period. The allocation/calibration time period was selected as the years with the most representative rainfall compared to all historic data. The time period used for allocation was 10/1/1992 through 9/30/1997. Modeling during the representative period provided the highest confidence in allocation results.

### **Sediment**

There are no existing in-stream criteria for sediment in Virginia; therefore, a reference watershed approach was used to define allowable TMDL loading rates in the Laurel Fork watershed. The South Fork Powell River watershed was selected as the TMDL reference for Laurel Fork due to the similarity of the watershed characteristics. The TMDL sediment loads were defined as the modeled sediment load for existing conditions from the non-impaired South Fork Powell River watershed and area-adjusted to the Laurel Fork watershed. The Generalized Watershed Loading Function (GWLF) model (Haith et al., 1992) was used for comparative modeling between Laurel Fork and South Fork Powell River.

**Existing Conditions****Fecal Coliform**

Wildlife populations, the rate of failure of septic systems, domestic pet populations, and numbers of livestock in the Laurel Fork watershed are examples of land-based nonpoint sources used to calculate fecal coliform loads. Also represented in the model were direct nonpoint sources of uncontrolled discharges, direct deposition by wildlife, and direct deposition by livestock. Contributions from all of these sources were updated to 2005 conditions to establish existing conditions for the watershed. The HSPF model provided a comparable match to the VADEQ monitoring data, with output from the model indicating violations of both the instantaneous and geometric mean standards throughout the Laurel Fork watershed.

**Sediment**

The sediment TMDL goal for Laurel Fork was defined by the average annual sediment load in metric tons per year (Mg/yr) from the area-adjusted South Fork Powell River. The existing conditions were calculated for Laurel Fork. The future conditions were 20.73 Mg/yr greater than the existing conditions; therefore, the sediment loads for future growth conditions was used to determine the sediment TMDL.

The sediment TMDL is composed of three components: waste load allocations (WLA) from permitted point sources, the load allocation (LA) from nonpoint/non-permitted sources, and a margin of safety (MOS), which was set to 10% for this study. The target sediment load was 1,851 Mg/yr. The future load from Laurel Fork was 2,799 Mg/yr.

**Load Allocation Scenarios****Fecal Coliform**

The next step in the bacteria TMDL process was to reduce the various source loads to levels that would result in attainment of the water quality standards. Because Virginia's *E. coli* standard does not permit any exceedances of the standard, modeling was conducted for a target value of 0% exceedance of the geometric mean standard and 0% exceedance of the single sample maximum *E. coli* standard. Scenarios were evaluated to

predict the effects of different combinations of source reductions on final in-stream water quality.

Laurel Fork requires:

- 36% reductions in direct wildlife loads,
- 86% reductions in NPS wildlife loads
- 70% reductions in direct livestock loads,
- 99% reductions in NPS loads from agricultural and urban/residential areas, and
- 100% reductions in loads from straight pipes.

**Table ES.1 Average annual *E. coli* loads (cfu/year) modeled after allocation in the Laurel Fork watershed at the outlet.**

Impairment	WLA (cfu/year)	LA (cfu/year)	MOS	TMDL (cfu/year)
Laurel Fork	8.72E+11	1.81E+12	<i>Implicit</i>	2.69E+12
VA0091588	8.71E+11			
VAG400522	8.71E+08			

## Sediment

The next step in the sediment TMDL process was to reduce the various source loads to result in average annual sediment load less than the target sediment load. Scenarios were evaluated to predict the effects of different combinations of source reductions on final in-stream water quality. Allocations were developed at the outlet of Laurel Fork.

The final load allocation scenario for Laurel Fork requires a 33.7% overall reduction in sediment loads to the stream. Sediment loads from straight pipes need to be reduced 100% due to health implications and the requirements of the fecal bacteria TMDL. The final TMDL required similar reductions to sediment loads from abandoned mine land (41%), disturbed forest (41%), pasture (38%), high tillage row crops (38%), and streambank erosion (27%). No reductions to TSS permitted sources were required.

predict the effects of different combinations of source reductions on final in-stream water quality.

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VAG400522	8.71E+08			

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**Table ES.2 Average annual sediment loads (metric tons per year) modeled after allocation in the Laurel Fork watershed at the outlet.**

<b>Impairment</b>	<b>WLA (Mg/yr)</b>	<b>LA (Mg/yr)</b>	<b>MOS (Mg/yr)</b>	<b>TMDL (Mg/yr)</b>
Laurel Fork	21	1,830	206	2,057

### **Implementation**

The goal of the TMDL program is to establish a three-step path that will lead to attainment of water quality standards. The first step in the process is to develop TMDLs that will result in meeting water quality standards. This report represents the culmination of that effort for the fecal coliform, benthic and dissolved oxygen impairment on Laurel Fork. The second step is to develop a TMDL implementation plan (IP). The final step is to implement the TMDL IP and to monitor stream water quality to determine if water quality standards are being attained.

While Section 303(d) of the Clean Water Act (CWA) and current United States Environmental Protection Agency (EPA) regulations do not require the development of TMDL implementation plans as part of the TMDL process, they do require reasonable assurance that the load and waste load allocations can and will be implemented. Once a TMDL IP is developed, VADEQ will take the plan to the State Water Control Board (SWCB) for approval for implementing the pollutant allocations and reductions contained in the TMDL. Also, VADEQ will request SWCB authorization to incorporate the TMDL implementation plan into the appropriate waterbody. With successful completion of implementation plans, Virginia begins the process of restoring impaired waters and enhancing the value of this important resource.

To address the bacteria TMDL, reducing the human bacteria loading from straight pipes and failing septic systems should be a primary implementation focus because of the health implications. This component could be implemented through education on septic tank pump-outs as well as a septic system installation/repair program. Livestock exclusion from streams has been shown to be very effective in lowering bacteria concentrations in streams, both by reducing the direct cattle deposits and by providing additional riparian buffers.

To address the sediment TMDL, it is anticipated that reclamation of abandoned mine land (AML), and the correction of straight pipes will be initial targets of implementation. Erosion and sediment deposition from disturbed land generally abate over time as new growth emerges. One practice that has been successful on some sites involves regrading and vegetating disturbed areas, and constructing diversion ditches to direct water away from the disturbed area.

There is a measure of uncertainty associated with the final allocation development process. Monitoring performed upon completion of specific implementation milestones can provide insight into the effectiveness of implementation strategies, the need for amending the plan, and/or progress toward the eventual removal of the impairments from the 303(d) list.

***Public Participation***

During development of the TMDLs for Laurel Fork, public involvement was encouraged through two public meetings and one government kickoff meeting. An introduction of the agencies involved, an overview of the TMDL process, and the specific approach to developing the Laurel Fork TMDLs were presented at the first of the public meetings. Details of the pollutant sources and stressor identification were also presented at this meeting. Public understanding of, and involvement in, the TMDL process was encouraged. Input from this meeting was utilized in the development of the TMDL and improved confidence in the allocation scenarios. The final model simulations and the TMDL load allocations were presented during the final public meeting. There was a 30-day public comment period after the final public meeting and no written comments were received. Watershed stakeholders will have the opportunity to participate in the development of the TMDL IP.

**Table 5.2 Fecal coliform land-based loads deposited on all land uses and direct loads in the Laurel Fork watershed for existing conditions and for the final allocation.**

Source	Total Annual Loading for Existing Run (cfu/yr)	Total Annual Loading for Allocation Run (cfu/yr)	Percent Reduction
<b>Land use</b>			
AML	8.25E+12	1.16E+12	86
Commercial	4.24E+11	4.24E+09	99
Crops	2.08E+12	2.08E+10	99
Forest	1.10E+14	1.54E+13	86
Pasture	8.18E+13	8.18E+11	99
Reclaimed	1.11E+12	1.55E+11	86
Residential	6.40E+14	6.40E+12	99
Wetlands	1.20E+12	1.68E+11	86
<b>Direct</b>			
Human	3.52E+12	0.00E+00	100
Livestock	3.08E+11	9.24E+10	70
Wildlife	6.38E+12	4.09E+12	36

**Table 5.3 Average annual *E. coli* loads (cfu/year) modeled after allocation in the Laurel Fork watershed at the outlet.**

Impairment	WLA (cfu/year)	LA (cfu/year)	MOS	TMDL (cfu/year)
Laurel Fork	8.72E+11	1.81E+12	<i>Implicit</i>	2.69E+12
VA0091588	8.71E+11			
VAG400522	8.71E+08			

To determine if the allocation scenarios presented will be applicable in the future, the same scenarios were evaluated with an increase in permitted loads. The permitted loads were increased by a factor of 4 to simulate a population growth. Laurel Fork currently has three permits for fecal coliform, but only two will be in operation in the future (Northern Tazewell County WWTF VA0091588, and Residence STP VAG400522). The TMDL table that reflects this future scenario is in Appendix C.



**Table C.1** Average annual *E. coli* loads (cfu/year) modeled for the Laurel Fork watershed impairment after TMDL allocation with permitted point source loads increased four times.

Impairment	WLA (cfu/year)	LA (cfu/year)	MOS	TMDL (cfu/year)
Laurel Fork	3.49E+12	4.93E+11	<i>Implicit</i>	3.98E+12
VA0091588	2.61E+12			
VAG400522	2.61E+09			

(LAX, 38%), high tillage row crops (38%), and streambank erosion (27%). Scenario 2 shows reductions to land-based loads from only AML (57%) and disturbed forest (39%). Scenario 3 shows reductions to sediment loads from AML (57%) and streambank erosion (28%). All three scenarios meet the TMDL goal at a total sediment load reduction of 33.7%. Scenario 1 was chosen to use for the final TMDL due to the similar reductions to many different sediment sources.

**Table 10.2 Final TMDL allocation scenario for the impaired watershed.**

Sediment Source	Laurel Sediment Loads (Mg/yr)	Scenario 1 Reductions (Final) (%)	Scenario 1 Allocated Loads (Mg/yr)	Scenario 2 Reductions (%)	Scenario 2 Loads (Mg/yr)	Scenario 3 Reductions (%)	Scenario 3 Loads (Mg/yr)
<b>Pervious Area:</b>							
AML	1,610.58	41	950.24	57	692.55	57	692.55
Commercial	0.51	0	0.51	0	0.51	0	0.51
Forest-disturbed	48.01	41	28.33	39	29.29	0	48.01
Forest	113.40	0	113.40	0	113.40	0	113.40
Pasture - Hay	30.70	38	19.03	0	30.70	0	30.70
LAX	21.63	38	13.41	0	21.63	0	21.63
Residential	6.16	0	6.16	0	6.16	0	6.16
High Tillage	574.98	38	356.49	0	574.98	0	574.98
Low Tillage	66.01	0	66.01	0	66.01	0	66.01
Water	0.00	0	0.00	0	0.00	0	0.00
Reclaimed	212.56	0	212.56	0	212.56	0	212.56
Wetlands	0.26	0	0.26	0	0.26	0	0.26
<b>Impervious Area:</b>	0.00	0	0.00	0	0.00	0	0.00
Commercial	12.36	0	12.36	0	12.36	0	12.36
Residential	2.21	0	2.21	0	2.21	0	2.21
<b>Streambank Erosion</b>	67.94	27	49.59	0	67.94	28	48.91
<b>Straight pipes</b>	4.63	100	0.00	100	0.00	100	0.00
<b>Point Sources:</b>	0.00	0	0.00	0	0.00	0	0.00
Private residence	0.04	0	0.04	0	0.04	0	0.04
Northern Tazewell County WWTF	20.73	0	20.73	0	20.73	0	20.73
<b>Watershed Total</b>	<b>2,793</b>	<b>33.7</b>	<b>1,851</b>	<b>33.7</b>	<b>1,851</b>	<b>33.7</b>	<b>1,851</b>



# Virginia Department of Game and Inland Fisheries

6/16/2009 1:47:47 PM

## Fish and Wildlife Information Service

### VaFWIS Initial Project Assessment Report

Compiled on

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6/16/2009, 1:47:47 PM

Known or likely to occur within a 2 mile radius of 37,18,00.0

81,21,13.9

in 185 Tazewell County, VA

433 Known or Likely Species ordered by Status Concern for Conservation  
(displaying first 48) (48 species with Status\* or Tier I\*\*)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
050023	FESE	I	Bat, Indiana	Myotis sodalis		BOVA
060169	FESE	I	Bean (pearlymussel), Cumberland	Villosa trabalis		BOVA
060031	FESE	I	Mussel, oyster	Epioblasma capsaeformis		BOVA
060082	FESE	I	Pearlymussel, cracking	Hemistena lata		BOVA
060094	FESE	I	Pearlymussel, littlewing	Pegias fabula		BOVA
060051	FESE	I	Pigtoe, finerayed	Fusconaia cuneolus		BOVA
060052	FESE	I	Pigtoe, shiny	Fusconaia cor		BOVA
060122	FESE	I	Rabbitsfoot, rough	Quadrula cylindrica strigillata		BOVA
050035	FESE	II	Bat, Virginia big-eared	Corynorhinus townsendii virginianus		BOVA
040267	SE	I	Wren, Bewick's	Thryomanes bewickii		BOVA
060080	SE	II	Heelsplitter, Tennessee	Lasmigona holstonia		BOVA
040096	ST	I	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus		BOVA
010342	ST	II	Darter, longhead	Percina macrocephala		BOVA
040093	FSST	II	Eagle, bald	Haliaeetus leucocephalus		BOVA
060163	ST	IV	Papershell, fragile	Leptodea fragilis		BOVA
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
060121	FC	II	Kidneyshell, fluted	Ptychobranthus subtentum		BOVA
080214	FS	I	Stonefly, Beartown perlodid	Isoperla major		BOVA
080226	FS	I	Stonefly, Kosztarab's	Acroneuria kosztarabi		BOVA

			<u>common</u>			
100248	FS	I	<u>Fritillary, regal</u>	Speyeria idalia idalia		BOVA
010341	FSSS	II	<u>Logperch, blotchside</u>	Percina burtoni		BOVA
060050	FSSS	II	<u>Pigtoe, Tennessee</u>	Fusconaia barnesiana		BOVA
100154	FS	II	<u>Butterfly, Persius duskywing</u>	Erynnis persius persius		BOVA
010429	FS	III	<u>Sculpin, Bluestone</u>	Cottus sp. 1		BOVA
100001	FS	IV	<u>fritillary, Diana</u>	Speyeria diana		BOVA
040372	SS	I	<u>Crossbill, red</u>	Loxia curvirostra		BOVA
040306	SS	I	<u>Warbler, golden-winged</u>	Vermivora chrysoptera	Yes	BBA,BOVA
020020	SS	II	<u>Hellbender, eastern</u>	Cryptobranchus alleganiensis alleganiensis		BOVA
040213	SS	II	<u>Owl, northern saw-whet</u>	Aegolius acadicus		BOVA
040304	SS	II	<u>Warbler, Swainson's</u>	Limnothlypis swainsonii		BOVA
040266	SS	II	<u>Wren, winter</u>	Troglodytes troglodytes		BOVA
040094	SS	III	<u>Harrier, northern</u>	Circus cyaneus		BOVA
010090	SS	IV	<u>Shiner, mirror</u>	Notropis spectrunculus		BOVA
010126	SS	IV	<u>Stonecat</u>	Noturus flavus		BOVA
030012	CC	IV	<u>Rattlesnake, timber</u>	Crotalus horridus		BOVA
040264	SS	IV	<u>Creeper, brown</u>	Certhia americana		BOVA
040032	SS		<u>Egret, great</u>	Ardea alba egretta		BOVA
040366	SS		<u>Finch, purple</u>	Carpodacus purpureus		BOVA
040241	SS		<u>Flycatcher, alder</u>	Empidonax alnorum		BOVA
040285	SS		<u>Kinglet, golden-crowned</u>	Regulus satrapa		BOVA
040112	SS		<u>Moorhen, common</u>	Gallinula chloropus cachinnans		BOVA
040262	SS		<u>Nuthatch, red-breasted</u>	Sitta canadensis		BOVA
040278	SS		<u>Thrush, hermit</u>	Catharus guttatus		BOVA
040314	SS		<u>Warbler, magnolia</u>	Dendroica magnolia		BOVA
050045	SS		<u>Otter, northern river</u>	Lontra canadensis lataxina		BOVA
040225		I	<u>Sapsucker, yellow-bellied</u>	Sphyrapicus varius		BOVA
040319		I	<u>Warbler, black-throated green</u>	Dendroica virens		BOVA

To view **All 433 species** [View 433](#)

\* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed;  
FC=Federal Candidate; FS=Federal Species of Concern; SC=State Candidate; CC=Collection Concern; SS=State

Special Concern

\*\* I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

**Anadromous Fish Use Streams**

N/A

**Colonial Water Bird Survey**

N/A

**Threatened and Endangered Waters**

N/A

**Cold Water Stream Survey (Trout Streams)  
Managed Trout Species**

N/A

**Public Holdings:**

N/A

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY  
Office of Water Quality Assessments  
629 East Main Street P.O. Box 10009 Richmond, Virginia 23219

SUBJECT: Flow Frequency Determination  
Pocahontas STP - #VA0029602

TO: Fred Wyatt, SWRO

FROM: Paul E. Herman, P.E., WQAP

DATE: June 14, 1999

COPIES: Ron Gregory, Charles Martin, File

RECEIVED  
JUN 15 1999

DEQ-SWRO

This memo supersedes my August 16, 1994, memo to you concerning the subject VPDES permit.

The Pocahontas STP discharges to the Laurel Fork near Pocahontas, VA. Stream flow frequencies are required at this site by the permit writer for the purpose of calculating effluent limitations for the VPDES permit.

The USGS conducted several flow measurements on the Laurel Fork from 1993 to 1994. The measurements were made just upstream of the subject VPDES discharge point. The measurements made by the USGS correlated very well with the same day daily mean values from the continuous record gage on the Bluestone River near Falls Mills, VA (#03177710). The measurements and daily mean values were plotted on a logarithmic graph and a best fit line was drawn through the data points. The required flow frequencies from the reference gage were plotted on the regression line and the associated flow frequencies at the measurement site/discharge point were determined from the graph. The data for the reference gage and the measurement site/discharge point are presented below:

Bluestone River at Falls Mills, VA (#03177710):

Drainage Area = 44.2 mi<sup>2</sup>

1Q10 = 7.0 cfs	High Flow 1Q10 = 7.7 cfs
7Q10 = 8.7 cfs	High Flow 7Q10 = 13.0 cfs
30Q5 = 12.1 cfs	HM = 29 cfs

Laurel Fork at Pocahontas STP (#03177750):

Drainage Area = 14.6 mi<sup>2</sup>

1Q10 = 0.14 cfs = .091 m <sup>3</sup> /D	High Flow 1Q10 = 0.17 cfs = 0.11 m <sup>3</sup> /D
7Q10 = 0.20 cfs = .129 m <sup>3</sup> /D	High Flow 7Q10 = 0.37 cfs = 0.239 m <sup>3</sup> /D
30Q5 = 0.32 cfs = .207 m <sup>3</sup> /D	HM = 1.30 cfs = 0.84 m <sup>3</sup> /D
30Q10 = 0.32 cfs = .207 m <sup>3</sup> /D	

The high flow months are January through May. This analysis assumes there are no significant discharges, withdrawals or springs influencing the flow in the Laurel Fork upstream of the discharge point.

If there are any questions concerning this analysis, please let me know.

# MODEL FILE AND STREAM INSPECTION REPORT FORM

Page 1

Discharge Name: Big Vein Prison Site / Pocahontas STP Upgrade (Newsite)

Location: Rt. 644, Tazewell Co.

Model File Path/Name: \_\_\_\_\_

Inspection Date: 1/1

Modeler: F. M. Wyatt

## General Stream Information:

Stream Name: Laurel Fork

Basin: New River Section: 1 Class: IV Special Standards: None

Are the standards for this stream violated due to natural causes? (Y/N) N

Is the stream correctly classified? (Y/N) Y

If "N", what is the correct classification? \_\_\_\_\_

## Model Segmentation:

Number of segments to be modeled: 1

## Flow Gauge / Flow Frequency Information (Attach Copy):

Gauge Used: Laurel Fork at Pocahontas

Drainage Area/Observed Flow At The Gauge: 14.6 sq. mi./mgd

Drainage Area/Observed Flow At The Start of The Model: 14.6 - 3.9 = 10.7 sq. mi./mgd

7Q10 of the Gauge: 0.129 mgd

Flow Adjustment for Springs or Dischargers: \_\_\_\_\_ mgd

## Background Water Quality:

Elevation at the Start of the model: 2378 ft above mean sea level

Elevation at the End of the model: 2265 ft above mean sea level

Critical Temperature: 20.9 °C (attach data and analysis)

Ambient Monitoring Gauge Used: Laurel Fork at Pocahontas

## Additional Discharges Information:

Is there a discharger within 3 miles upstream of the proposed discharge? (Y/N) N

Does antidegradation apply to this analysis? (Y/N) N If so, which segment(s)? \_\_\_\_\_

Is any segment on the current 303(d) list for D.O. violations? (Y/N) N

Is any segment of the model within an approved D.O. TMDL segment? (Y/N) N

Is any discharge to the model intermittent? (Y/N) N

Any dams in stream section being modeled? (Y/N) N

## Notes/Sketch:

$$1Q10 = 0.091 \times (10.7/14.6) = 0.067 \text{ mgd}$$

$$7Q10 = 0.129 \times (10.7/14.6) = 0.095 \text{ mgd}$$

$$30Q10 = 0.207 \times (10.7/14.6) = 0.15 \text{ mgd}$$

$$\text{Wet } 1Q10 = 0.11 \times (10.7/14.6) = 0.081 \text{ mgd}$$

$$\text{Wet } 7Q10 = 0.239 \times (10.7/14.6) = 0.175 \text{ mgd}$$

$$30Q5 = 0.207 \times (10.7/14.6) = 0.15 \text{ mgd}$$

# MODEL FILE AND STREAM INSPECTION REPORT FORM

Page 2

(Fill In This Page FOR EACH SEGMENT To Be Modeled)

Segment Number:		
Reason for Defining Segment:	Discharge at Beginning of Segment	<input checked="" type="checkbox"/>
	Physical Change at Beginning of Segment	
	Tributary at Beginning of Segment	
Length of Segment (mi.): <u>3.7</u>		<u>3.7</u>
Drainage Area at Start of Segment (sq. mi.):		<u>10.7</u>
Drainage Area at End of Segment (sq. mi.):		<u>14.6</u>
Elevation at Start of Segment (ft.):		<u>2378</u>
Elevation at End of Segment (ft.):		<u>2265</u>
If Discharge or Tributary At Beginning of Segment, Complete the Following:		
Discharge/Tributary Name:		<u>Big Vein Prison Site STP</u>
Discharge/Tributary Temperature (C): (If different from background ambient)		<u>20</u>
Critical Discharge/Tributary Flow (mgd): (Design/Permitted Flow or 7Q10 Condition) (use permitted or design flow for discharges, 7Q10 flow from flow frequency analysis for tributaries)		<u>0.500</u>
For Dischargers Only: (use permitted Concentrations)	CBOD <sub>5</sub> (mg/l):	<u>18</u>
	TKN (mg/l):	<u>11.9 dry, 15.3 wet</u>
	D.O. (mg/l):	<u>6.5</u>
General Type of Cross Section in Segment: (7Q10 Condition)		
Rectangular <input checked="" type="checkbox"/> Triangular ___ Deep Narrow U ___ Wide Shallow Arc ___ Irregular ___ No Defined Channel ___		
General Channel Characteristics of Segment: (7Q10 Condition)		
Mostly Straight ___ Moderately Meandering <input checked="" type="checkbox"/> Severely Meandering ___ No Defined Channel ___		
Does the stream have a pool and riffle character (Y/N)? (7Q10 Condition)		<u>Y</u>
If "Y":	% of length that is pools <u>50</u>	Average depth of pools (ft) <u>1.5</u>
	% of length that is riffles <u>50</u>	Average depth of riffles (ft) <u>1</u>
Bottom:	Sand ___ Silt ___ Gravel ___ Small Rock <input checked="" type="checkbox"/> Large Rock ___ Boulders ___	
Sludge Deposits:	None <input checked="" type="checkbox"/> Trace ___ Light ___ Heavy ___	
Plants:	Rooted: None <input checked="" type="checkbox"/> Few ___ Light ___ Heavy ___	
	Algae: None <input checked="" type="checkbox"/> Film on Edges Only ___ Film on Entire Bottom ___	
Projected 7Q10 Width of Segment (ft): (must be projected by modeler based on site visit)		<u>8</u>
Projected 7Q10 Depth of Segment (ft): (can be calculated by model based on width)		<u>2</u>
Projected 7Q10 Velocity of Segment (ft): (can be calculated by model based on width)		<u>3.3</u>
Does the water have an evident green color? (Y/N)		<u>N</u>



# MODEL FILE AND STREAM INSPECTION REPORT FORM

Page 2

(Fill In This Page FOR EACH SEGMENT To Be Modeled)

<b>Segment Number:</b>		
<b>Reason for Defining Segment:</b>	Discharge at Beginning of Segment	
	Physical Change at Beginning of Segment	
	Tributary at Beginning of Segment	
<b>Length of Segment (mi.):</b>		
<b>Drainage Area at Start of Segment (sq. mi.):</b>		
<b>Drainage Area at End of Segment (sq. mi.):</b>		
<b>Elevation at Start of Segment (ft.):</b>		
<b>Elevation at End of Segment (ft.):</b>		
<b>If Discharge or Tributary At Beginning of Segment, Complete the Following:</b>		
<b>Discharge/Tributary Name:</b>		
<b>Discharge/Tributary Temperature (C):</b> (If different from background ambient)		
<b>Critical Discharge/Tributary Flow (mgd):</b> (Design/Permitted Flow or 7Q10 Condition) (use permitted or design flow for discharges, 7Q10 flow from flow frequency analysis for tributaries)		
<b>For Dischargers Only:</b> (use permitted Concentrations)	<b>CBOD<sub>5</sub> (mg/l):</b>	
	<b>TKN (mg/l):</b>	
	<b>D.O. (mg/l):</b>	
<b>General Type of Cross Section in Segment: (7Q10 Condition)</b> Rectangular <input type="checkbox"/> Triangular <input type="checkbox"/> Deep Narrow U <input type="checkbox"/> Wide Shallow Arc <input type="checkbox"/> Irregular <input type="checkbox"/> No Defined Channel <input type="checkbox"/>		
<b>General Channel Characteristics of Segment: (7Q10 Condition)</b> Mostly Straight <input type="checkbox"/> Moderately Meandering <input type="checkbox"/> Severely Meandering <input type="checkbox"/> No Defined Channel <input type="checkbox"/>		
<b>Does the stream have a pool and riffle character (Y/N)? (7Q10 Condition)</b>		
<b>If "Y":</b>	<b>% of length that is pools</b> _____	<b>Average depth of pools (ft)</b> _____
	<b>% of length that is riffles</b> _____	<b>Average depth of riffles (ft)</b> _____
<b>Bottom:</b>	Sand <input type="checkbox"/> Silt <input type="checkbox"/> Gravel <input type="checkbox"/> Small Rock <input type="checkbox"/> Large Rock <input type="checkbox"/> Boulders <input type="checkbox"/>	
<b>Sludge Deposits:</b>	None <input type="checkbox"/> Trace <input type="checkbox"/> Light <input type="checkbox"/> Heavy <input type="checkbox"/>	
<b>Plants:</b>	<b>Rooted:</b> None <input type="checkbox"/> Few <input type="checkbox"/> Light <input type="checkbox"/> Heavy <input type="checkbox"/>	
	<b>Algae:</b> None <input type="checkbox"/> Film on Edges Only <input type="checkbox"/> Film on Entire Bottom <input type="checkbox"/>	
<b>Projected 7Q10 Width of Segment (ft):</b> (must be projected by modeler based on site visit)		
<b>Projected 7Q10 Depth of Segment (ft):</b> (can be calculated by model based on width)		
<b>Projected 7Q10 Velocity of Segment (ft):</b> (can be calculated by model based on width)		
<b>Does the water have an evident green color? (Y/N)</b>		

# MODEL FILE AND STREAM INSPECTION REPORT FORM

Page 2

(Fill In This Page FOR EACH SEGMENT To Be Modeled)

<b>Segment Number:</b>		
<b>Reason for Defining Segment:</b>	Discharge at Beginning of Segment	
	Physical Change at Beginning of Segment	
	Tributary at Beginning of Segment	
<b>Length of Segment (mi.):</b>		
<b>Drainage Area at Start of Segment (sq. mi.):</b>		
<b>Drainage Area at End of Segment (sq. mi.):</b>		
<b>Elevation at Start of Segment (ft.):</b>		
<b>Elevation at End of Segment (ft.):</b>		
<b>If Discharge or Tributary At Beginning of Segment, Complete the Following:</b>		
<b>Discharge/Tributary Name:</b>		
<b>Discharge/Tributary Temperature (C):</b> (If different from background ambient)		
<b>Critical Discharge/Tributary Flow (mgd):</b> (Design/Permitted Flow or 7Q10 Condition) (use permitted or design flow for discharges, 7Q10 flow from flow frequency analysis for tributaries)		
<b>For Dischargers Only:</b> (use permitted Concentrations)	<b>CBOD<sub>5</sub> (mg/l):</b>	
	<b>TKN (mg/l):</b>	
	<b>D.O. (mg/l):</b>	
<b>General Type of Cross Section in Segment: (7Q10 Condition)</b> Rectangular ___ Triangular ___ Deep Narrow U ___ Wide Shallow Arc ___ Irregular ___ No Defined Channel ___		
<b>General Channel Characteristics of Segment: (7Q10 Condition)</b> Mostly Straight ___ Moderately Meandering ___ Severely Meandering ___ No Defined Channel ___		
<b>Does the stream have a pool and riffle character (Y/N)? (7Q10 Condition)</b>		
<b>If "Y":</b>	<b>% of length that is pools</b> _____	<b>Average depth of pools (ft)</b> _____
	<b>% of length that is riffles</b> _____	<b>Average depth of riffles (ft)</b> _____
<b>Bottom:</b>	Sand ___ Silt ___ Gravel ___ Small Rock ___ Large Rock ___ Boulders ___	
<b>Sludge Deposits:</b>	None ___ Trace ___ Light ___ Heavy ___	
<b>Plants:</b>	<b>Rooted:</b>	None ___ Few ___ Light ___ Heavy ___
	<b>Algae:</b>	None ___ Film on Edges Only ___ Film on Entire Bottom ___
<b>Projected 7Q10 Width of Segment (ft):</b> (must be projected by modeler based on site visit)		
<b>Projected 7Q10 Depth of Segment (ft):</b> (can be calculated by model based on width)		
<b>Projected 7Q10 Velocity of Segment (ft):</b> (can be calculated by model based on width)		
<b>Does the water have an evident green color? (Y/N)</b>		

Effluent flow = .4 MGD  
 Stream 7Q10 flow = .142 MGD  
 Width = 10 ft  
 Bottom scale = 4  
 Channel has normal irregularities

Stream 1Q10 flow = .103 MGD  
 Slope (ft/ft) = .004798

#### CHRONIC RESULTS

7Q10 depth = 0.28 ft  
 7Q10 velocity = 0.30 ft/sec = 4.9 mi / day  
 Mixing length @ 7Q10 = 211 ft =  
 Residence time = 0.008 days

\*\*COMPLETE MIX MAY BE USED FOR THE CHRONIC WLA\*\*  
 Percent of 7Q10 to be used for WLAc = 100%

#### ACUTE RESULTS

1Q10 depth = 0.26 ft  
 1Q10 velocity = 0.29 ft/sec = 4.8 mi / day  
 Mixing length @ 1Q10 = 219 ft =  
 Residence time = 0.207 hours

\*\*COMPLETE MIX MAY BE USED FOR THE ACUTE WLA\*\*  
 Percent of 1Q10 to be used for WLAa = 100%

Use print screen for hard copy

C:\MIXPROG>

*Lateral Fork*

*Slope 0.0048 ft/ft*

*5280 x 1.5 mi = 7920 ft*

*2305 - 2267 = 38 ft*

*$\frac{38}{7920} = 0.0048$*

PGM=RET

9-LRR002.19 VA9-01FX0060 VA9-LX0060  
37 18 16.0 081 20 25.0 1  
RT. 644 BRIDGE IN POCAHONTAS  
51185 VIRGINIA TAZEWEILL  
02-OHIO RIVER + KANAWHA  
9-NEW  
21VASWCB 770106 HQ 050500002012

/TYPA/AMBN/STREAM

0001.040 OFF

0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	SMK OR DEPTH (FT)	00010 WATER TEMP CENT	00400 PH	00299 DO PROBE MG/L	00900 TOT HARD CACO3 MG/L	00619 UN-IONZD NH3-NH3 MG/L
94/02/15	1158	WATER 0.983999	6.3	6.84	12.4	89	High
94/04/20	1233	WATER 0.983999	15.1	7.73	10.3	110	High
94/07/28	1029	WATER 0.983999	17.1	6.71	7.7	87	Low
94/10/27	1111	WATER 0.983999	9.1		2.2	200	Low
95/01/12	1115	WATER 0.983999	8.7	6.82	8.4	110	High
95/03/29	1330	WATER 0.983999	12.0	7.30	9.9	120	High
95/05/16	1017	WATER 0.983999	12.7	6.65	9.3	56	High
95/07/11	1056	WATER 0.983999	20.5	6.91	3.8	191	Low
95/09/19	1305	WATER 0.983999	16.6	7.13	2.4	200	Low
95/11/14	0944	WATER 0.983999	4.9	6.96	8.9	119	Low
96/01/22	1129	WATER 0.983999	5.2	6.94	11.6	75	High
96/03/14	1010	WATER 0.983999	6.6	7.18	11.4	100	High
96/05/01	1112	WATER 0.983999	10.1	7.17	10.1	98	High
96/07/10	1155	WATER 0.983999	19.5	7.31	2.2	186	Low
96/09/10	1050	WATER 0.983999	18.9	6.83	3.9	168	Low
96/11/04	1045	WATER 0.983999	6.4	7.20	7.3	198	Low
97/01/13	1030	WATER 0.983999	4	7.43	12.7	118	High
97/03/19	1100	WATER 0.983999	8.0	6.97	10.6	69	High
97/05/12	1135	WATER 0.983999	12.5	7.15	9.8	115	High
97/07/16	0950	WATER 0.983999				170	Low
97/09/08	1010	WATER 0.983999	17.0	6.73	4.5	202	Low
97/11/24	1155	WATER 0.983999	4.5	7.26	7.2	196	Low
98/03/11	1210	WATER 0.983999	3.0	7.18	13.2	95	High
98/05/05	1130	WATER 0.983999	12.0	7.17	9.6	88	High
98/07/22	1030	WATER 0.983999	21.0	7.07	1.9	163	Low
98/08/24	1115	WATER 0.983999	20.9	6.87	3.2	185	Low
98/10/19	1055	WATER 0.983999	15.6	6.76	2.7	212	Low
98/12/21	1055	WATER 0.983999	6.6	7.24	5.9	190	Low

1THAT'S ALL FOLKS

High Flow Period  
90th % temp.: 12.7°C  
90th % pH : 7.43

Low Flow Period:  
90th. % temp.: 20.9°C  
90th % pH : 7.26

# Calculation of Total Ammonia Nitrogen Limits (continued)

## At Proposed Discharge

The water quality wasteload allocations (AWLAs) are calculated as follows, assuming a background concentration of 0:

$$AWLA_{ad} = \text{acute dry WLA} = \frac{[AO_d (Qs-1_{dry} + Qe) - Qs-1_{dry}(\text{background})]}{Qe}$$

$$AWLA_{ad} = \text{acute dry WLA} = \frac{[26 (0.067 + 0.500) - 0]}{0.500} = 29.5 \text{ mg/l}$$

$$AWLA_{aw} = \text{acute wet WLA} = \frac{[AO_w (Qs-1_{wet} + Qe) - Qs-1_{wet}(\text{background})]}{Qe}$$

$$AWLA_{aw} = \text{acute wet WLA} = \frac{[23 (0.081 + 0.500) - 0]}{0.500} = 26.7 \text{ mg/l}$$

$$CWLA_{cd} = \text{chronic dry WLA} = \frac{[CO_d (Qs-7_{dry} + Qe) - Qs-7_{dry}(\text{background})]}{Qe}$$

$$CWLA_{cd} = \text{chronic dry WLA} = \frac{[3.4 (0.15 + 0.500) - 0]}{0.500} = 4.4 \text{ mg/l}$$

$$CWLA_{cw} = \text{chronic wet WLA} = \frac{[CO_w (Qs-7_{wet} + Qe) - Qs-7_{wet}(\text{background})]}{Qe}$$

$$CWLA_{cw} = \text{chronic wet WLA} = \frac{[4.7 (0.15 + 0.500) - 0]}{0.500} = 6.1 \text{ mg/l}$$

# New Discharge Point

modout.txt

"Model Run For E:\PocahontasBigVein.mod On 10/22/2003 1:30:41 PM"

"Model is for LAUREL FORK."

"Model starts at the BIGVEINPOCAHONTAS STP discharge."

## "Background Data"

"7Q10"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.0945,	2,	0,	7.381,	20.9

## "Discharge/Tributary Input Data for Segment 1"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.5,	18,	11.9,	6.5,	20

8.9 M<sup>3</sup>/s

## "Hydraulic Information for Segment 1"

"Length"	"Width"	"Depth"	"Velocity"
"(mi)"	"(ft)"	"(ft)"	"(ft/sec)"
3.7,	7.999,	.306,	.376

## "Initial Mix Values for Segment 1"

"Flow"	"DO"	"cBOD"	"nBOD"	"DOSat"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.5945,	6.64,	38.639,	32.409,	8.335,	20.14311

## "Rate Constants for Segment 1. - (All units Per Day)"

"k1"	"k1@T"	"k2"	"k2@T"	"kn"	"kn@T"	"BD"	"BD@T"
1.2,	1.208,	18.324,	18.387,	.5,	.506,	0,	0

## "Output for Segment 1"

"Segment starts at BIGVEINPOCAHONTAS STP"

"Total"	"Segm."	"Dist."	"Dist."	"DO"	"cBOD"	"nBOD"
"(mi)"	"(mi)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"
0,	0,	6.64,	38.639,	32.409		
.1,	.1,	6.2,	37.888,	32.144		
.2,	.2,	5.888,	37.151,	31.881		
.3,	.3,	5.671,	36.429,	31.62		
.4,	.4,	5.524,	35.721,	31.361		
.5,	.5,	5.428,	35.027,	31.104		
.6,	.6,	5.371,	34.346,	30.849		
.7,	.7,	5.342,	33.678,	30.597		
.8,	.8,	5.333,	33.023,	30.347		
.9,	.9,	5.339,	32.381,	30.099		
1,	1,	5.356,	31.751,	29.853		
1.1,	1.1,	5.381,	31.134,	29.609		
1.2,	1.2,	5.412,	30.529,	29.367		
1.3,	1.3,	5.447,	29.935,	29.127		

## modout.txt

1.2,	1.2,	5.432,	30.027,	35.219
1.3,	1.3,	5.497,	29.197,	34.888
1.4,	1.4,	5.563,	28.39,	34.56
1.5,	1.5,	5.629,	27.606,	34.235
1.6,	1.6,	5.695,	26.843,	33.913
1.7,	1.7,	5.76,	26.101,	33.594
1.8,	1.8,	5.824,	25.38,	33.278
1.9,	1.9,	5.886,	24.679,	32.965
2,	2,	5.947,	23.997,	32.655
2.1,	2.1,	6.007,	23.334,	32.348
2.2,	2.2,	6.065,	22.689,	32.044
2.3,	2.3,	6.122,	22.062,	31.743
2.4,	2.4,	6.178,	21.452,	31.445
2.5,	2.5,	6.232,	20.859,	31.15
2.6,	2.6,	6.285,	20.283,	30.857
2.7,	2.7,	6.337,	19.723,	30.567
2.8,	2.8,	6.387,	19.178,	30.28
2.9,	2.9,	6.436,	18.648,	29.996
3,	3,	6.484,	18.133,	29.714
3.1,	3.1,	6.531,	17.632,	29.435
3.2,	3.2,	6.576,	17.145,	29.159
3.3,	3.3,	6.62,	16.671,	28.885
3.4,	3.4,	6.663,	16.21,	28.614
3.5,	3.5,	6.705,	15.762,	28.345
3.6,	3.6,	6.746,	15.326,	28.079
3.7,	3.7,	6.786,	14.903,	27.815

"END OF FILE"

# New Discharge Point

modout.txt

\*\*\*SEASONAL RUN\*\*\*

"Wet Season is from January to May."

"Model Run For E:\PocahontasBigVein.mod On 10/22/2003 1:41:17 PM"

"Model is for LAUREL FORK."

"Model starts at the BIGVEINPOCAHONTAS STP discharge."

"Background Data"

"7Q10",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.1752,	2,	0,	8.735,	12.7

"Discharge/Tributary Input Data for Segment 1"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.5,	22,	15.3,	6.5,	20

(2.3 NH3-N)

"Hydraulic Information for Segment 1"

"Length",	"Width",	"Depth",	"Velocity"
"(mi)",	"(ft)",	"(ft)",	"(ft/sec)"
3.7,	7.999,	.4666032,	.2798901

"Initial Mix Values for Segment 1"

"Flow",	"DO",	"cBOD",	"nBOD",	"DOSat",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.6752,	7.08,	42.028,	39.442,	8.669,	18.10615

"Rate Constants for Segment 1. - (All units Per Day)"

"k1",	"k1@T",	"k2",	"k2@T",	"kn",	"kn@T",	"BD",	"BD@T"
1.4,	1.283,	18.324,	17.519,	.5,	.432,	0,	0

"Output for Segment 1"

"Segment starts at BIGVEINPOCAHONTAS STP"

"Total", "Segm."

"Dist.",	"Dist.",	"DO",	"cBOD",	"nBOD"
"(mi)",	"(mi)",	"(mg/l)",	"(mg/l)",	"(mg/l)"
0,	0,	7.08,	42.028,	39.442
.1,	.1,	6.313,	40.867,	39.072
.2,	.2,	5.819,	39.738,	38.705
.3,	.3,	5.511,	38.64,	38.341
.4,	.4,	5.329,	37.572,	37.981
.5,	.5,	5.232,	36.534,	37.624
.6,	.6,	5.193,	35.524,	37.271
.7,	.7,	5.192,	34.542,	36.921
.8,	.8,	5.217,	33.588,	36.574
.9,	.9,	5.258,	32.66,	36.23
1,	1,	5.31,	31.758,	35.89
1.1,	1.1,	5.369,	30.88,	35.553



## modout.txt

1.4,	1.4,	5.484,	29.353,	28.889
1.5,	1.5,	5.523,	28.782,	28.653
1.6,	1.6,	5.563,	28.222,	28.419
1.7,	1.7,	5.604,	27.673,	28.186
1.8,	1.8,	5.645,	27.135,	27.955
1.9,	1.9,	5.686,	26.607,	27.726
2,	2,	5.727,	26.09,	27.499
2.1,	2.1,	5.768,	25.583,	27.274
2.2,	2.2,	5.809,	25.086,	27.051
2.3,	2.3,	5.849,	24.598,	26.83
2.4,	2.4,	5.888,	24.12,	26.61
2.5,	2.5,	5.927,	23.651,	26.392
2.6,	2.6,	5.965,	23.191,	26.176
2.7,	2.7,	6.003,	22.74,	25.962
2.8,	2.8,	6.04,	22.298,	25.75
2.9,	2.9,	6.076,	21.865,	25.539
3,	3,	6.112,	21.44,	25.33
3.1,	3.1,	6.147,	21.023,	25.123
3.2,	3.2,	6.181,	20.614,	24.917
3.3,	3.3,	6.215,	20.213,	24.713
3.4,	3.4,	6.248,	19.82,	24.511
3.5,	3.5,	6.281,	19.435,	24.31
3.6,	3.6,	6.313,	19.057,	24.111
3.7,	3.7,	6.345,	18.687,	23.914

"END OF FILE"

Facility = Big Vein/Pocahontas Prison Site

Chemical = Ammonia Nitrogen

Chronic averaging period = 30

WLAa = 29.5

WLAc = 4.4

Q.L. = 0.2

# samples/mo. = 1

# samples/wk. = 1

#### Summary of Statistics:

# observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

# < Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 8.87774841103177

Average Weekly limit = 8.87774841103177 = 8.9 *mg/l*

Average Monthly Limit = 8.87774841103177 = 8.9 *mg/l*

The data are:

Facility = Big Vein/Pocahontas Prison Site

Chemical = Ammonia Nitrogen

Chronic averaging period = 30

WLAa = 26.7

WLAc = 6.1

Q.L. = 0.2

# samples/mo. = 1

# samples/wk. = 1

#### Summary of Statistics:

# observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

# < Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 12.3077875698395

Average Weekly limit = 12.3077875698395 = 12.3 mg/l

Average Monthly Limit = 12.3077875698395 = 12.3 mg/l

The data are:

**9-LRR001.39**      Temp Celcius   Field Ph   HARDNESS, EDTA (MG/L AS CaCO3)

20/02/2001	6.30	6.97	64
18/12/2000	1.50	6.69	155
12/10/2000	8.70	7.12	173
21/12/1998	6.60	7.24	190
19/10/1998	15.60	6.76	212
24/08/1998	20.90	6.87	185
22/07/1998	21.00	7.07	163
05/05/1998	12.00	7.17	88
11/03/1998	3.00	7.18	95
24/11/1997	4.50	7.26	196
08/09/1997	17.00	6.73	202
16/07/1997			170
12/05/1997	12.50	7.15	115
19/03/1997	8.00	6.97	69
13/01/1997	.40	7.43	118
04/11/1996	6.40	7.20	198
10/09/1996	18.90	6.83	168
10/07/1996	19.50	7.31	186
01/05/1996	10.10	7.17	98
14/03/1996	6.60	7.18	100
22/01/1996	5.20	6.94	75
14/11/1995	4.90	6.96	119
19/09/1995	16.60	7.13	200
11/07/1995	20.50	6.91	191
16/05/1995	12.70	6.65	56
29/03/1995	12.00	7.30	120
12/01/1995	8.70	6.82	110
27/10/1994	9.10		200
28/07/1994	17.10	6.71	87
20/04/1994	15.10	7.73	110
15/02/1994	6.30	6.84	89
25/10/1993	10.00	6.81	100
01/07/1993	20.40	6.95	194
22/04/1993	7.20	6.98	100
07/01/1993	6.40	7.09	120
08/10/1992	12.50	6.85	214
21/10/1991	9.60	7.39	220
11/09/1991	19.10	7.42	192
27/06/1991	16.10	7.65	108
16/05/1991	16.10	7.48	70
18/04/1991	12.80	7.49	116
05/03/1991	5.40	7.86	66
13/02/1991	5.20	7.88	106
07/01/1991	7.20	7.66	130
03/12/1990	9.20	7.45	234
07/11/1990	6.60	7.57	236
15/10/1990	13.80	7.60	202
19/09/1990	15.20	7.61	218
21/08/1990	2.11	7.44	224
02/07/1990	7.50	7.25	189
13/06/1990	13.90	7.64	182

16/05/1990	15.80	7.52	132
24/04/1990	12.10	7.82	98
28/03/1990	6.80		88
20/02/1990	6.20	8.45	92
16/01/1990	6.70	6.88	126
05/12/1989	1.70	7.70	128
07/11/1989	5.30	7.37	202
17/10/1989	10.30	7.43	166
12/09/1989	14.10	7.65	158
16/08/1989	14.00	7.29	214
13/06/1989	13.00	7.76	140
15/05/1989	8.00	7.27	114
15/05/1989	8.00	7.27	114
25/04/1989	9.60	7.43	164
15/03/1989	10.20	7.76	128
14/02/1989	4.40	7.66	130

Collection Date Time	Sta Id	Temp Celcius	Field Ph	NITROGEN AMMONIA TOTAL (MG/L AS N)	Com Code
12/12/2006	9-LRR001.39	3.70	7.50	460	
25/10/2006	9-LRR001.39	7.20	7.20	700	
17/08/2006	9-LRR001.39	21.20	7.20	120	
21/06/2006	9-LRR001.39	18.10	7.40	100	
20/04/2006	9-LRR001.39	11.90	6.80	040	
07/02/2006	9-LRR001.39	2.53	7.08	100	
07/12/2005	9-LRR001.39	3.74	7.24	580	
24/10/2005	9-LRR001.39	11.83	7.31	1450	
29/08/2005	9-LRR001.39	21.62	7.33	170	
29/06/2004	9-LRR001.39	14.30	7.26	050	
12/05/2004	9-LRR001.39	15.34	7.20	070	
29/04/2004	9-LRR001.39	9.60	7.76	040 U	
22/03/2004	9-LRR001.39	4.33	6.92	170	
03/03/2004	9-LRR001.39	7.40	7.24	270	
29/01/2004	9-LRR001.39	2.30	6.95	040 U	
15/12/2003	9-LRR001.39	3.60	7.11	070	
04/11/2003	9-LRR001.39	11.60	7.00	1240	
08/09/2003	9-LRR001.39	17.50	7.05	150	
05/08/2003	9-LRR001.39	17.30	7.03	700	
09/07/2003	9-LRR001.39	19.50	7.18	100	
29/06/2004	9-LRR001.73	15.90	6.74	1350	
29/04/2004	9-LRR001.73	10.70	7.46	1480 Q	
03/03/2004	9-LRR001.73	7.60	6.65	1730	
15/12/2003	9-LRR001.73	4.70	6.74	1800	
05/08/2003	9-LRR001.73	20.40	6.95	2410	
29/06/2004	9-LRR002.59	14.70	7.59	040 U	
12/05/2004	9-LRR002.59	12.56	7.11	040 U	
29/04/2004	9-LRR002.59	9.60	7.90	040 U	
22/03/2004	9-LRR002.59	4.50	7.58	040 U	
03/03/2004	9-LRR002.59	7.90	7.40	040 U	
29/01/2004	9-LRR002.59	.03	7.53	040 U	
15/12/2003	9-LRR002.59	3.10	7.23	040 U	
04/11/2003	9-LRR002.59	14.00	6.36	040 U	
08/09/2003	9-LRR002.59	17.50	7.38	040 U	
05/08/2003	9-LRR002.59	16.50	6.26	080	
09/07/2003	9-LRR002.59	21.70	6.64	040 U	
29/06/2004	9-LRR005.59	15.40	7.34	040 U	
12/05/2004	9-LRR005.59	17.78	7.62	040 U	
29/04/2004	9-LRR005.59	10.30	7.49	040 U	
22/03/2004	9-LRR005.59	5.44	7.81	040 U	
03/03/2004	9-LRR005.59	8.40	7.50	040 U	
29/01/2004	9-LRR005.59	.85	7.44	040 U	
15/12/2003	9-LRR005.59	3.70	7.04	040 U	
04/11/2003	9-LRR005.59	14.70	7.46	040 U	
08/09/2003	9-LRR005.59	18.90	7.36	O	
05/08/2003	9-LRR005.59	17.70	7.49	060	
09/07/2003	9-LRR005.59	20.90	7.42	050	

		HARDNESS	200.00
ACUTE		WQSACUTE	
	COPPER ug/l		25.8
CHRONIC		WQSCHRONIC	
			16.2

---

		HARDNESS	200.00
ACUTE		WQSACUTE	
	LEAD ug/l		287.37
CHRONIC		WQSCHRONIC	
			32.65

---

		HARDNESS	200.00
ACUTE		WQSACUTE	
	ZINC ug/l		215.57
CHRONIC		WQSCHRONIC	
			215.57

---

		HARDNESS	200.00
ACUTE		WQSACUTE	
	CADMIUM ug/l		8.57
CHRONIC		WQSCHRONIC	
			1.95

---

		HARDNESS	200.00
ACUTE		WQSACUTE	
	CHROMIUM III ug/l		1005.17
CHRONIC		WQSCHRONIC	
			130.75

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		HARDNESS	200.00
ACUTE		WQSACUTE	
	NICKEL ug/l		327.79
CHRONIC		WQSCHRONIC	
			36.43

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		HARDNESS	200.00
ACUTE		WQSACUTE	
	SILVER ug/l		11.37

Northern Tazewell Co. WWTP  
Metals Calculations for Attachment A

WLA formula =  $\frac{\text{chronic standard (except silver)} (7010 + \text{eff. flow})}{(\text{eff. flow})} \text{ ug/l}$

$$\text{Antimony: } 4300 \left( \overset{304.5}{0.075} + 0.500 \right) / 0.500 \text{ ug/l} = \overset{500}{5540} \text{ ug/l}$$

$$\text{Arsenic: } 150 (0.095 + 0.500) / 0.500 \text{ ug/l} = \overset{100}{178} \text{ ug/l}$$

$$\text{Cadmium: } 1.95 (0.095 + 0.500) / 0.500 \text{ ug/l} = \overset{2}{2.3} \text{ ug/l}$$

$$\text{Chromium III: } 130.75 (0.095 + 0.500) / 0.500 \text{ ug/l} = \overset{100}{156} \text{ ug/l}$$

$$\text{Chromium VI: } 11 (0.095 + 0.500) / 0.500 \text{ ug/l} = 13 \text{ ug/l}$$

$$\text{Copper: } 16.2 (0.095 + 0.500) / 0.500 \text{ ug/l} = 19 \text{ ug/l}$$

$$\text{Lead: } 32.65 (0.095 + 0.500) / 0.500 \text{ ug/l} = 39 \text{ ug/l}$$

$$\text{Mercury: } 0.77 (0.095 + 0.500) / 0.500 \text{ ug/l} = \overset{0.9}{0.92} \text{ ug/l}$$

$$\text{Nickel: } 36.43 (0.095 + 0.500) / 0.500 \text{ ug/l} = 43 \text{ ug/l}$$

$$\text{Selenium: } 7.41 (0.095 + 0.500) / 0.500 \text{ ug/l} = \overset{8}{8.8} \text{ ug/l}$$

$$\text{Silver: } 11.37 \left( \overset{1010}{0.067} + 0.500 \right) / 0.500 \text{ ug/l} = 13 \text{ ug/l}$$

$$\text{Thallium: } 6.3 (0.095 + 0.500) / 0.500 \text{ ug/l} = \overset{7}{7.5} \text{ ug/l}$$

$$\text{Zinc: } 215.57 (0.095 + 0.500) / 0.500 \text{ ug/l} = \overset{200}{256} \text{ ug/l}$$



MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION  
SOUTHWEST REGIONAL OFFICE

P. O. Box 888  
Abingdon, VA 24210

SUBJECT: Northern Tazewell County WWTF (VA0091588)

TO: Technical File

FROM: <sup>wbc</sup> Wade B. Carico, Water Compliance Specialist Sr.

DATE: September 26, 2007

COPIES:

: PAGE 1 OF 1

On September 25, 2007 I visited the new Northern Tazewell County WWTF near Pocahontas, Virginia. The purpose of the visit was to conduct a Technical Assistance/Start-Up inspection. Todd Little, the WWTF Superintendent, was present for the inspection. The WWTF was put into service on July 12, 2007. All sewage from the Town of Pocahontas was directed into the new Pump Station at the old Pocahontas STP and is being pumped to the new WWTF. Recently the new prison started discharging to the WWTF, however, until the day of this inspection, only prison employees and administration personnel were at the prison. As of the day of this inspection, the prison was to receive 50 inmates. The prison capacity is 1000 inmates. Mr. Little was unsure if and/or when the prison might reach capacity. The treatment at the facility consists of the following: Influent Pump Station, Traveling Screen, Vortex Grit Removal System, Two Sequential Batch Reactors, Post Equalization Basin, Ultra-Violet Disinfection, and Post Aeration. Sludge treatment consists of an Aerobic Digester and Belt Filter Press. The old Bossevain Pump Station presently pumps to the new Pump Station near the old Pocahontas STP. Mr. Little stated that plans are to cut into the Bossevain Force Main and make a connection to the gravity line from the prison at the new WWTF. This would eliminate the need for the force main from the new connection to where the force main connects to the Town of Pocahontas gravity sewer. Plant operation and laboratory analysis was discussed during the visit. It appears that the facility has sufficient laboratory equipment to perform all the required analyses to satisfy permit requirements and Mr. Little appears well versed in laboratory procedures. None of the PSA operators attended the Quality Control training conducted at SWRO by Betsy Ziomek. Mr. Little was informed of the new QC requirements and a copy of the training material will be forwarded to Mr. Little. The facility appeared to be operating efficiently at the time of the visit. The SBR contents had a good color and good mixing. The contents of the Post Equalization Basin appeared clear. All equipment was operable.



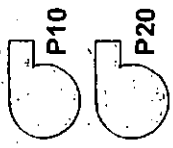
Cascade  
Aerator

Influent Flow Rate 0.0 MGD

Effluent Flow Rate 0.0 MGD

Waste Activated Sludge Flow 0.0 MGD

Influent Pump Station

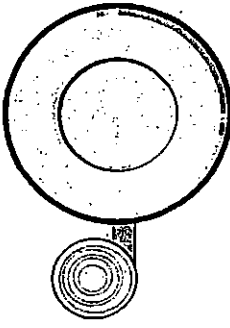


Belt Press

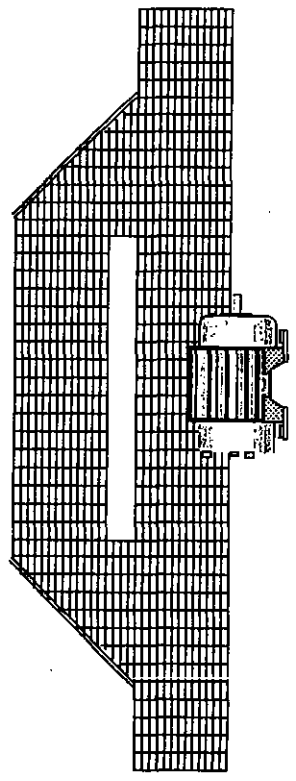


SBR Flow 49.0 GPM

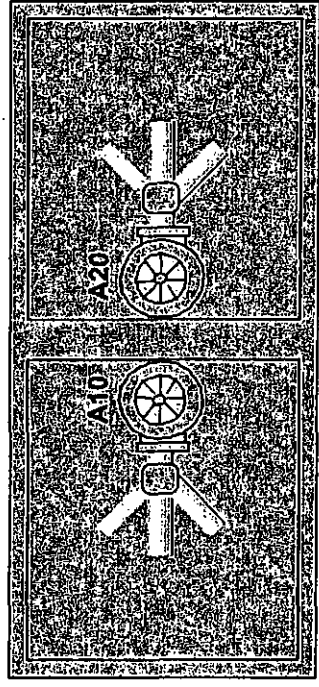
Grit Unit



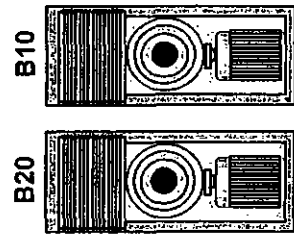
Mechanical Screen Unit



Digester



Blower Pad



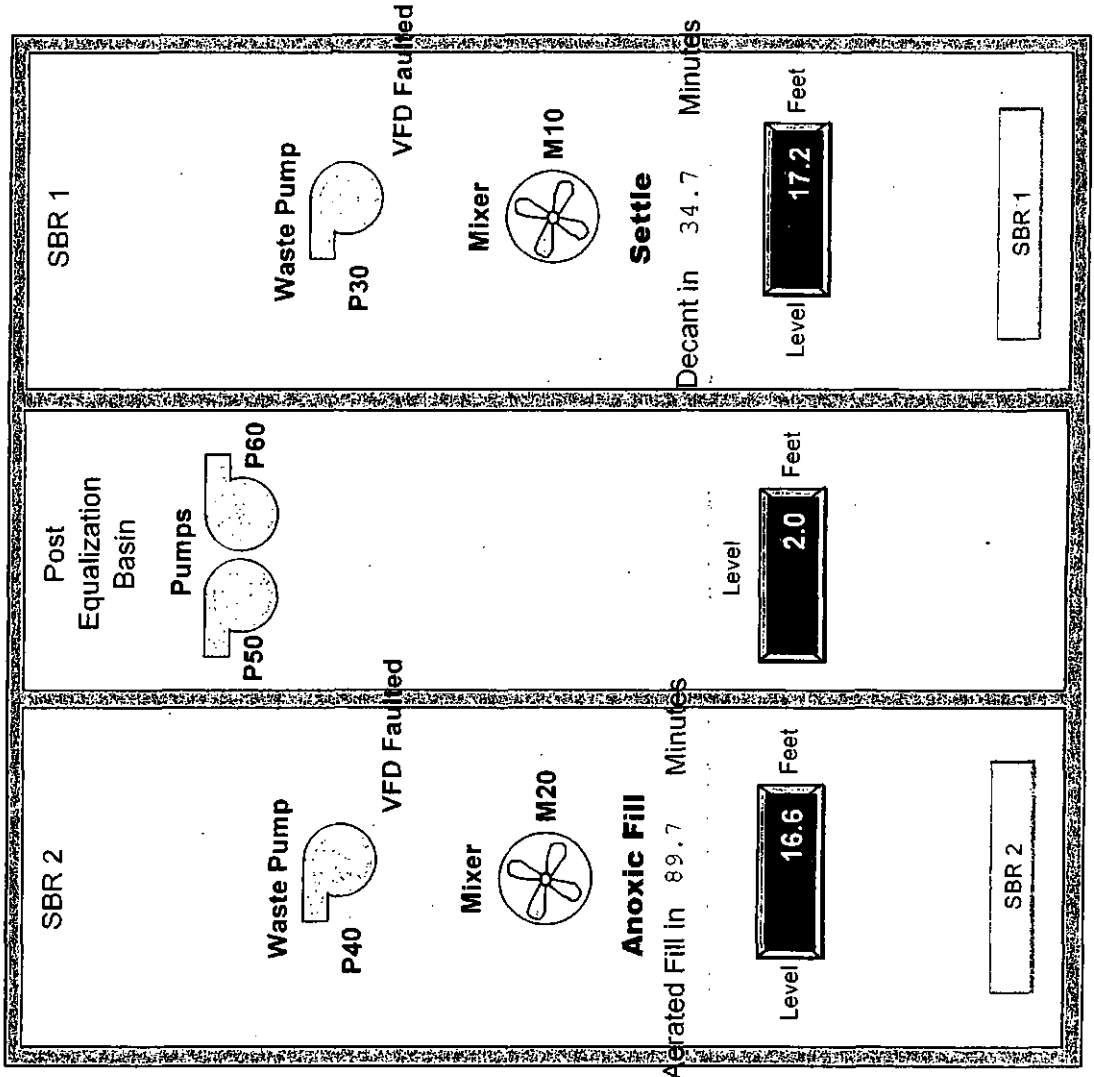
UV S



Shut Down De



Warm



SBR
Elapsed
T

**DEQ  
WASTEWATER FACILITY  
INSPECTION REPORT  
PREFACE**

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0091588	12/22/2004		12/21/2009
Facility Name	Address		Telephone Number
Northern Tazewell County WWTF	Route 102 just North of Pocahontas, VA Tazewell County PSA, P. O. Box 190 North Tazewell, VA 24630		(276) 988-2243
Owner Name	Address		Telephone Number
Tazewell County PSA	Tazewell County PSA, P. O. Box 190 North Tazewell, VA 24630		(276) 988-1822
Responsible Official	Title		Telephone Number
James H. Spencer	Administrator		(276) 988-1822
Responsible Operator	Classification/License #		Telephone Number
Todd Little	Class III - 1911 003014		(276) 988-2243

TYPE OF FACILITY:

DOMESTIC				INDUSTRIAL			
Federal		Major		Major		Primary	
Non-federal		Minor	X	Minor		Secondary	

INFLUENT CHARACTERISTICS:

DESIGN:

	Flow	.5 MGD	
	Population Served	~ 900	
	Connections Served	~325	
	BOD <sub>5</sub>	240	
	TSS	240	

EFFLUENT LIMITS:

Parameter	Minimum	Average	Maximum	Parameter	Minimum	Average	Maximum
Flow - MGD		0.5	NL	353 NH3		8.9	8.9
pH - SU	6.0		9.0	423 CBOD - mg/L		22	33
TSS - mg/l		30	45	424 CBOD - mg/L		18	27
DO - mg/l	6.5						
E. Coli - N/MCL		126					
352 NH3 - mg/L		12	12				

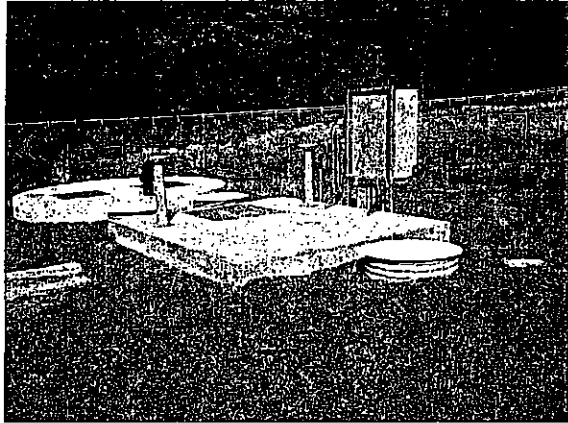
	Receiving Stream	Laurel Fork Creek	
	Basin	New River	
	Discharge Point (LAT)	081°21'07" W	
	Discharge Point (LONG)	37°17'57" N	

Northern Tazewell Co. WWTF (VA0091588) – Assistance – 09/25/2007

WWTF



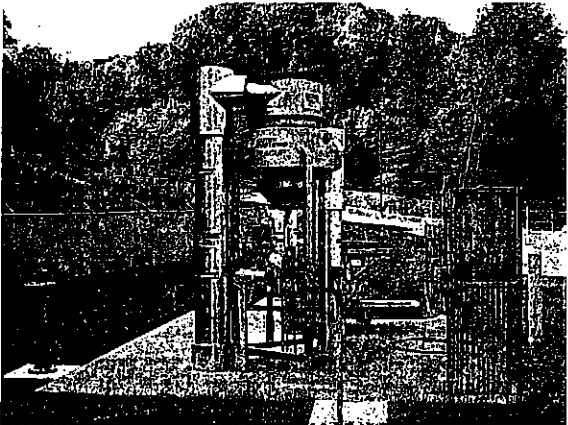
Influent Pump Station



Headworks – Traveling Screen



Teacup Grit Remover



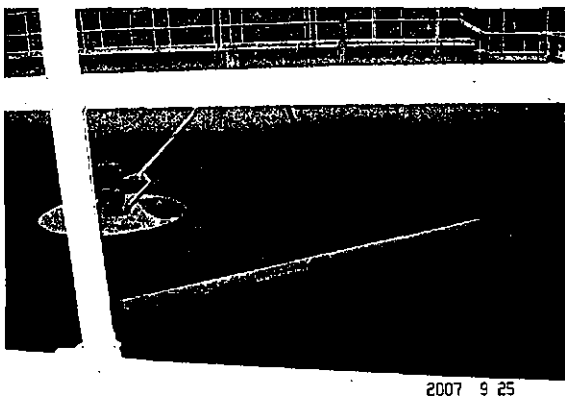
Close-up of Teacup Grit Collector



# 1 SBR



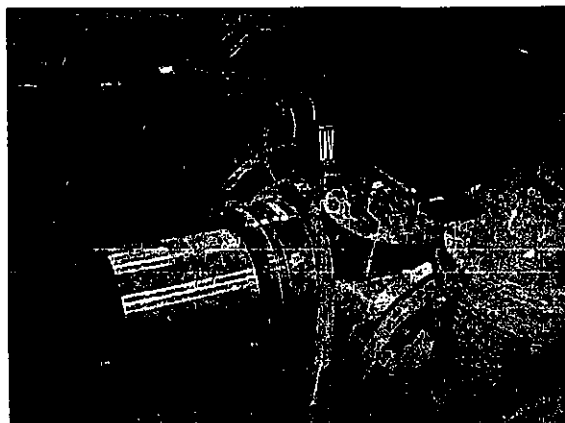
# 2 SBR



Effluent EQ Basin



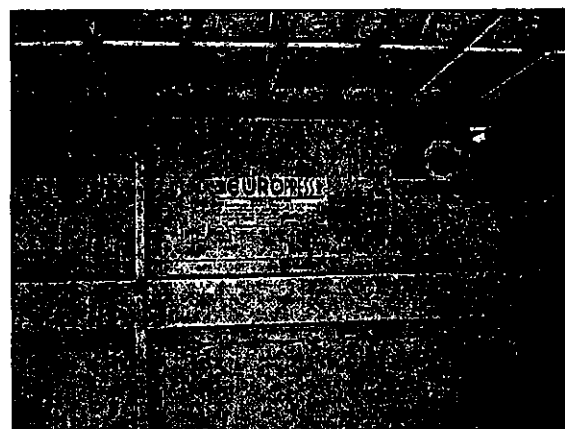
One of the in-line UV units



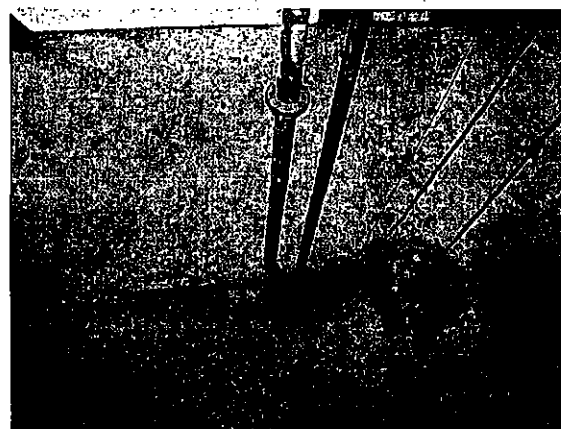
Step/Cascade Post Aerator



Sludge Belt Filter Press



Aerobic Digester





# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF ENVIRONMENTAL QUALITY

### SOUTHWEST REGIONAL OFFICE

L. Preston Bryant, Jr.  
Secretary of Natural Resources

355 Deadmore Street, P.O. Box 1688, Abingdon, Virginia 24212  
(276) 676-4800 Fax (276) 676-4899  
[www.deq.virginia.gov](http://www.deq.virginia.gov)

David K. Paylor  
Director

Dallas R. Sizemore  
Regional Director

October 30, 2008

SUBJECT: Tazewell County  
Tazewell County PSA  
Northern Tazewell County  
Regional Wastewater Treatment Facility  
Certificate to Operate

Mr. Jim Spencer  
Tazewell County PSA  
PO Box 190  
North Tazewell, VA 24630

Dear Mr. Spencer:

In accordance with Section 790 of the Commonwealth of Virginia *Sewage Collection and Treatment Regulations*, enclosed is a revised Certificate to Operate (CTO) for the Northern Tazewell County Regional Wastewater Treatment Facility, located in Tazewell County. This CTO includes the Belt Filter Press and Aerobic Digester.

Additionally enclosed are copies of the Engineer's Certificate, dated October 6, 2008

Sincerely,

A handwritten signature in black ink, appearing to read "Daniel P. Scott".

Daniel P. Scott, PE  
Area Engineer (Southwest)  
Department of Environmental Quality  
Office of Wastewater Engineering

c: DEQ-SWRO  
Thompson & Litton  
Cumberland Plateau Health District - Dr. John Dreyzehner  
DEQ-CAP - Charles Via  
DEQ-OWE - Archives

## CERTIFICATE TO OPERATE

**Owner:** Tazewell County PSA

**Facility/System Name:** Northern Tazewell County Regional Wastewater Treatment Facility

**VPDES Permit Number:** VA0091588

**Description of Facility/System:** An 0.5 MGD STW comprised of a duplex influent pump station, mechanical screen with manual cleaned bypass, teacup grit removal system, duplex rectangular SBR, post equalization basin, UV disinfection system, cascade aeration, NPW system, belt filter press and aerobic digesters.

The collection system includes two 300 gpm duplex submersible sewage pump stations, servicing the main collection lines for the Town of Pocahontas and Tazewell County influents.

The Reliability Class for this facility is Class III.

**This CTO is conditional upon the completion, testing, inspection and approval of the belt filter press system.**

### AUTHORIZATION TO OPERATE:

The owner is authorized to operate this facility in accordance with Section 790 of the Commonwealth of Virginia *Sewage Collection and Treatment Regulations*.

**Issued By:**



Area Engineer (Southwest)  
Department of Environmental Quality  
Office of Wastewater Engineering

October 30, 2008  
Date



# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF ENVIRONMENTAL QUALITY

### SOUTHWEST REGIONAL OFFICE

L. Preston Bryant, Jr.  
Secretary of Natural Resources

355 Deadmore Street, P.O. Box 1688, Abingdon, Virginia 24212  
(276) 676-4800 Fax (276) 676-4899  
[www.deq.virginia.gov](http://www.deq.virginia.gov)

David K. Paylor  
Director

Michael D. Overstreet  
Regional Director

October 10, 2007

SUBJECT: Tazewell County  
Pocahontas/Northern Tazewell County  
Regional Sewer System Project  
Operations & Maintenance Manual  
Northern Tazewell Regional STW  
PT Log# 22901

Mr. Ike Ball  
Tazewell County PSA  
PO Box 190  
North Tazewell, VA 24630

Dear Mr. Ball:

An Operations & Maintenance Manual for the Tazewell County PSA Pocahontas/Northern Tazewell County Regional STW, located in Tazewell County, as prepared by Thompson & Litton, has been received by this Department.

The Operations & Maintenance Manual is entitled "Operations & Maintenance Manual for the Northern Tazewell County Wastewater Treatment Facility" and is PE stamped dated September 2007.

The evaluation of this Operations & Maintenance Manual has been confined to technical requirements and criteria, as stipulated in the Commonwealth of Virginia *Sewage Collection and Treatment Regulations*. (9VAC 25-790).

In accordance with the *Code of Virginia* 1950, as amended, Title 62.1, Section 62.1-44.19, this letter report is to advise that the previously mentioned Operations & Maintenance Manual is technically adequate.

If you have any questions, please contact me at (276) 676-4866 or (276) 646-3577 or email at [dpsscott@deq.virginia.gov](mailto:dpsscott@deq.virginia.gov).

Sincerely,

Daniel P. Scott, PE  
Area Engineer (Southwest)  
Office of Wastewater Engineering

c: DEQ - SWRO  
Thompson & Litton - Brian McGough  
DEQ - CAP - Charles Via  
Cumberland Plateau Health District - Dr. John Dreyzehner  
DEQ-OWE - Archives



**State "Transmittal Checklist" to Assist in Targeting  
Municipal and Industrial Individual NPDES Draft Permits for Review**

**Part I. State Draft Permit Submission Checklist**

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name: Northern Tazewell County Regional Wastewater Treatment Facility  
 NPDES Permit Number: VA0091588  
 Permit Writer Name: Fred M. Wyatt  
 Date: July 8, 2009

Major ☐ Minor ☒ Industrial ☐ Municipal ☒

**I.A. Draft Permit Package Submittal Includes:**

	Yes	No	N/A
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit– entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?		X	
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?		X	
6. A Reasonable Potential analysis showing calculated WQBELs?		X	
7. Dissolved Oxygen calculations?	X		
8. Whole Effluent Toxicity Test summary and analysis?			X
9. Permit Rating Sheet for new or modified industrial facilities?			X

**I.B. Permit/Facility Characteristics**

	Yes	No	N/A
1. Is this a new, or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet or permit contain a description of the wastewater treatment process?	X		

<b>I.B. Permit/Facility Characteristics– cont.</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>
4.	Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5.	Has there been any change in streamflow characteristics since the last permit was developed?		X	
6.	Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7.	Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8.	Does the facility discharge to a 303(d) listed water?	X		
a.	Has a TMDL been developed and approved by EPA for the impaired water?	X		
b.	Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?			X
c.	Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	X		
9.	Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10.	Does the permit authorize discharges of storm water?		X	
11.	Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12.	Are there any production-based, technology-based effluent limits in the permit?		X	
13.	Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14.	Are any WQBELs based on an interpretation of narrative criteria?		X	
15.	Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16.	Does the permit contain a compliance schedule for any limit or condition?		X	
17.	Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18.	Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19.	Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20.	Have previous permit, application, and fact sheet been examined?	X		

## Part II. NPDES Draft Permit Checklist

### Region III NPDES Permit Quality Checklist – for POTWs (To be completed and included in the record only for POTWs)

#### II.A. Permit Cover Page/Administration

	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

#### II.B. Effluent Limits– General Elements

	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?			X

#### II.C. Technology-Based Effluent Limits (POTWs)

	Yes	No	N/A
1. Does the permit contain numeric limits for <u>ALL</u> of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

#### II.D. Water Quality-Based Effluent Limits

	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?			X

<b>II.D. Water Quality-Based Effluent Limits – cont.</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a “reasonable potential” evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the “reasonable potential” evaluation was performed in accordance with the State’s approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have “reasonable potential”?	X		
d. Does the fact sheet indicate that the “reasonable potential” and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?	X		
e. Does the permit contain numeric effluent limits for all pollutants for which “reasonable potential” was determined?	X		
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an “antidegradation” review was performed in accordance with the State’s approved antidegradation policy?	X		

<b>II.E. Monitoring and Reporting Requirements</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?		X	

<b>II.F. Special Conditions</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?			X

**II.F. Special Conditions – cont.**

	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	X		
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
a. Does the permit require implementation of the "Nine Minimum Controls"?			X
b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?	X		

**II.G. Standard Conditions**

II.G. Standard Conditions	Yes	No	N/A
1. Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		
<b>List of Standard Conditions – 40 CFR 122.41</b>			
Duty to comply	Property rights	Reporting Requirements	
Duty to reapply	Duty to provide information	Planned change	
Need to halt or reduce activity	Inspections and entry	Anticipated noncompliance	
not a defense	Monitoring and records	Transfers	
Duty to mitigate	Signatory requirement	Monitoring reports	
Proper O & M	Bypass	Compliance schedules	
Permit actions	Upset	24-Hour reporting	
		Other non-compliance	
2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?	X		

**State "Transmittal Checklist" to Assist in Targeting  
Municipal and Industrial Individual NPDES Draft Permits for Review**

**Part I. State Draft Permit Submission Checklist**

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name: Northern Tazewell County Regional Wastewater Treatment Facility  
 NPDES Permit Number: VA0091588  
 Permit Writer Name: Fred M. Wyatt  
 Date: July 8, 2009

Major ☐Minor ☒Industrial ☐Municipal ☒

**I.A. Draft Permit Package Submittal Includes:**

	Yes	No	N/A
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit- entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?		X	
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?		X	
6. A Reasonable Potential analysis showing calculated WQBELs?		X	
7. Dissolved Oxygen calculations?	X		
8. Whole Effluent Toxicity Test summary and analysis?			X
9. Permit Rating Sheet for new or modified industrial facilities?			X

**I.B. Permit/Facility Characteristics**

	Yes	No	N/A
1. Is this a new, or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet or permit contain a description of the wastewater treatment process?	X		

**I.B. Permit/Facility Characteristics– cont.**

	Yes	No	N/A
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?		X	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?	X		
a. Has a TMDL been developed and approved by EPA for the impaired water?	X		
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?			X
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	X		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?		X	
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

## Part II. NPDES Draft Permit Checklist

### Region III NPDES Permit Quality Checklist – for POTWs (To be completed and included in the record only for POTWs)

#### II.A. Permit Cover Page/Administration

	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

#### II.B. Effluent Limits– General Elements

	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether “antibacksliding” provisions were met for any limits that are less stringent than those in the previous NPDES permit?			X

#### II.C. Technology-Based Effluent Limits (POTWs)

	Yes	No	N/A
1. Does the permit contain numeric limits for <u>ALL</u> of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

#### II.D. Water Quality-Based Effluent Limits

	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?			X



<b>II.D. Water Quality-Based Effluent Limits – cont.</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a “reasonable potential” evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the “reasonable potential” evaluation was performed in accordance with the State’s approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have “reasonable potential”?	X		
d. Does the fact sheet indicate that the “reasonable potential” and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?	X		
e. Does the permit contain numeric effluent limits for all pollutants for which “reasonable potential” was determined?	X		
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an “antidegradation” review was performed in accordance with the State’s approved antidegradation policy?	X		

<b>II.E. Monitoring and Reporting Requirements</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?		X	

<b>II.F. Special Conditions</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?			X

**II.F. Special Conditions – cont.**

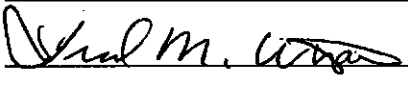
	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	X		
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
a. Does the permit require implementation of the "Nine Minimum Controls"?			X
b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?	X		

**II.G. Standard Conditions**

II.G. Standard Conditions	Yes	No	N/A
1. Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		
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Permit actions	Upset	24-Hour reporting	
		Other non-compliance	
2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?	X		

### Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	<u>Fred M. Wyatt</u>
Title	<u>Environmental Engineer Sr.</u>
Signature	<u></u>
Date	<u>07/08/2009</u>